ORION

B. G. TILAK.

THE ORION

OR RESEARCHES INTO

THE ANTIQUITY OF THE VEDAS

BY

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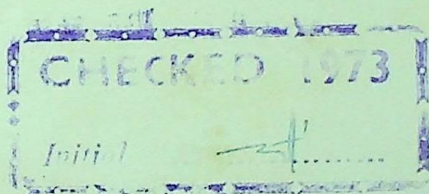
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PREFACE.

SOME explanation may be necessary for the publication of an essay on the antiquity of the Vedas by one whose professional work lies in a different direction. About four years ago, as I was reading the Bhagavad Gîtâ, it occurred to me that we might derive important conclusions from the statement of Kṛishṇa that "he was Mârgashîrṣha of the months." This led me to inquire into the primitive Vedic calendar, and the result of four years' labour is now placed before the public. The essay was originally written for the Ninth Oriental Congress held in London last year. But it was found too large to be inserted in the proceedings wherein its summary alone is now included. I have had therefore to publish it separately, and in doing so I have taken the opportunity of incorporating into it such additions, alterations and modifications, as were suggested by further thought and discussion.

The chief result of my inquiry would be evident from the title of the essay. The high antiquity of the Egyptian civilization is now generally admitted. But scholars still hesitate to place the commencement of the Vedic civilization earlier than 2400 B. C. I have endeavoured to show in the following pages that the traditions recorded in the Rigveda unmistakably point to a period *not later* than 4000 B. C., when the vernal equinox was in Orion, or, in other words, when the Dog-star (or the Dog as we have it in the Rigveda) commenced the equinoctial year. Many of the Vedic texts and legends, quoted in support of this conclusion, have been cited in this connection and also rationally and intelligently explained for the first time, thus throwing

a considerable light on the legends and rites in later Sanskrit works. I have further tried to show how these legends are strikingly corroborated by the legends and traditions of Iran and Greece. Perhaps some of this corroborative evidence may not be regarded as sufficiently conclusive by itself, but in that case I hope it will be borne in mind that my conclusions are not based merely upon mythological or philological coincidences, and if some of these are disputable, they do not in any way shake the validity of the conclusions based on the *express* texts and references scattered over the whole Vedic literature. I wanted to collect together all the facts that could possibly throw any light upon, or be shown to be connected with the question in issue, and if in so doing I have mentioned some, that are not as convincing as the others, I am sure that they will at least be found interesting, and that even after omitting them there will be ample evidence to establish the main point. I have, therefore, to request my critics not to be prejudiced by such facts, and to examine and weigh the whole evidence I have adduced in support of my theory before they give their judgment upon it.

I have tried to make the book as little technical as possible ; but I am afraid that those who are not acquainted with the Hindu method of computing time may still find it somewhat difficult to follow the argument in a few places. If my conclusions come to be accepted and the second edition of the book be called for, these defects may be removed by adding further explanations in such cases. At present I have only attempted to give the main argument on the assumption that the reader is already familiar with the method. I may further remark that though I have

used the atronomical method, yet a comparison with Bentley's work will show that the present essay is more literary than astronomical in its character. In other words, it is the Sanskrit scholars who have first of all to decide if my interpretations of certain texts are correct, and when this judgment is once given it is not at all difficult to astronomically calculate the exact period of the traditions in the Rigveda. I do not mean to say that no knowledge of astronomy is necessary to discuss the subject, but on the whole it would be readily seen that the question is one more for Sanskrit scholars than for astronomers to decide.

Some scholars may doubt the possibility of deriving so important and far-reaching conclusions from the data furnished by the hymns of the Rigveda, and some may think that I am taking the antiquity of the Vedas too far back. But fears like these are out of place in a historical or scientific inquiry, the sole object of which should be to search for and find out the truth. The method of investigation followed by me is the same as that adopted by Bentley, Colebrooke and other well-known writers on the subject, and, in my opinion, the only question that Sanskrit scholars have now to decide, is whether I am or am not justified in carrying it a step further than my predecessors, independently of any modifications that may be thereby made necessary in the existing hypothesis on the subject.

I have omitted to mention in the essay that a few native scholars have tried to ascertain the date of the Mahâbhârata, and the Râmâyaṇa from certain positions of the sun, the moon and the planets given in those works. For instance, the horoscope of Râma and the positions of the planets at the time of the great civil war, as found in the Mahâbhârata,

are said to point to a period of 5000 or 6000 B. C., and it is contended that the Vedas which preceded these works must be older still. Bentley relying on the same date has calculated 961 B. C. as the exact date of Râma's birth. This will show how unsafe it is to act upon calculations based upon such loose statements. Sometimes the accounts in the Purâṇas are themselves conflicting, but even where they are or can be made definite any conclusions based on them are not only doubtful, but well nigh useless for chronological purposes, for in the first instance they are open to the objection that these works may not have been written by eye-witnesses (the mention *Râshis* in the Râmâyaṇa directly supporting such an assumption), and secondly, because it is still more difficult to prove that we now possess these books in the form in which they were originally written. With regard to the positions of the planets at the time of the war given in the Mahâbhârata, the statements are undoubtedly confused; but apart from it, I think that it is almost a gratuitous assumption to hold that all of them really give us the positions of the planets in the ecliptic and that such positions again refer to the fixed and the moveable zodiacal portions of the Nakshatras. Perhaps the writers simply intend to mention all auspicious or inauspicious positions of the planets in such cases. I have therefore avoided all such debatable and doubtful points by confining myself solely to the Vedic works, about the genuineness of which there can be no doubt, and using the Purâṇic accounts only to corroborate the results deduced from the Vedic texts. According to this view the Mahâbhârata war must be placed in the Kṛittikâ period, inasmuch as we are told that Bhîṣhma was waiting for the turning of the sun from the winter solstice in the month

of Mâgha. The poem, as we now have it, is evidently written a long time after this event.

Lastly, I have to express my obligations to several friends for encouraging me to carry on the inquiry and helping me in one way or another to complete this essay. My special thanks are however due to Dr. Râmkrishna Gopâl Bhândârkar, who kindly undertook to explain to me the views of German scholars in regard to certain passages from the Rigveda, and to Khan Bahadur Dr. Dastur Hoshang Jamasp for the ready assistance he gave in supplying information contained in the original Parsi sacred books. I am also greatly indebted to Prof. Max Müller for some valuable suggestions and critical comments on the etymological evidence contained in the essay. I am, however, alone responsible for all the views, suggestions, and statements made in the following pages.

With these remarks I leave the book in the hands of critics, fully relying upon the saying of the poet—

हेम्नः संलक्ष्यते ह्यग्नौ विशुद्धिः श्यामिकाऽपि वा।

"The fineness or the darkness of gold is best tested in fire." It is not likely that my other engagements will permit me to devote much time to this subject in future ; and I shall consider myself well rewarded if the present essay does in any way contribute to a fuller and unprejudiced discussion of the high antiquity of the Aryan civilization, of which our sacred books are the oldest records in the world.

B. G. Tilak.

Poona, October, 1893.

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श्वानं बस्तो बोधयितारमब्रवीत्संवत्सर इदमद्या व्यख्यन। ऋ० १-१६१-१३.

Spana. peshupana. Vd.xiii, 9. *Spanem. zairitem. chathru chashmem*. Vd. viii. 16. [*See page* 110, 111.

THE ORION

OR

Researches into the Antiquity of the Vedas.

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CHAPTER I.

INTRODUCTION.

Importance of ascertaining the Age of the Vedas—Linguistic method—Its defects—Astronomical method—Its difficulties unduly magnified—Views of European and Native scholars examined.

THE VEDA is the oldest of the books that we now possess, and it is generally admitted "that for a study of man, or if you like, for a study of Aryan humanity, there is nothing in the world equal in importance with it."* There is no other book which carries us so near the beginning of the Aryan civilization, if not the absolute beginning of all things, as maintained by the Hindu theologians; and the importance of ascertaining even approximately the age when the oldest of the Vedic Ṛishis, like the classical Vâlmiki, may have been inspired to unconsciously give utterance to a Vedic verse, cannot therefore be overrated. The birth of Gautama Buddha, the invasion of Alexander the Great, the inscriptions of Ashoka, the account of the Chinese travellers, and the overthrow of Buddhism and Jainism by Bhaṭṭa Kumârila and Shankarâchârya, joined with several other less important

* India: what it can teach us? p. 112. The references throughout are to the first edition of this work.

events, have served to fix the chronology of the later periods of the Ancient Indian History. But the earlier periods of the same still defy all attempts to ascertain their chronology; and the earliest of them all, so important to the "true student of mankind," the period of the Rigveda, is still the subject of vague and uncertain speculations. Can we or can we not ascertain the age of the Vedas? This is a question which has baffled the ingenuity of many an ancient and a modern scholar, and though I have ventured to write on the subject I cannot claim to have finally solved this important problem in all its bearings. I only wish to place before the pu blic the result of my researches in this direction and leave it to scholars to decide if it throws any additional light on the earliest periods of the Aryan civilization.

But before I proceed to state my views, it may be useful to briefly examine the methods by which Oriental scholars have hitherto attempted to solve the question as to the age and character of the Vedas. Prof. Max Müller divides the Vedic literature into four periods—the Chhandas, Mantra, Brâhmaṇa, and Sûtra; and as each period presupposes the preceding, while the last or the Sûtra period is prior, "if not to the origin, at least to the spreading and political ascendancy of Buddhism" in the fourth century before Christ, that learned scholar, by assigning two hundred years for each period arrives at about 1200 B. C., *as the latest date*, at which we may suppose the Vedic hymns to have been composed.* This, for convenience, may be

* See Max Müller's 1st Ed. of Rig. Vol. IV., Pref. pp. v., vii. This preface is also printed as a separate pamphlet under the title "Ancient Hindu Astronomy and Chronology." In the second edition of the Rigveda the prefaces in the first edition are reprinted all together at the beginning of the fourth Volume.

called the literary or the linguistic method of ascertaining the age of the Vedas. A little consideration will, however, at once disclose the weak points in such arbitrary calculations. There are different opinions as to the division of the Vedic literature ; some scholars holding that the Chhandas and Mantra is one period, though a long one. But granting that the Vedic literature admits of a four-fold division, the question of the duration of each period is still involved in uncertainty and, considering the fact that each period might run into and overlap the other to a certain extent, it becomes extremely difficult to assign even the minimum chronological limits to the different periods. The method may, indeed, be used with advantage to show that the Vedas could not have been composed later than a certain period ; but it helps little in even approximately fixing the correct age of the Vedas. Prof. Max Müller himself admits* that the limit of 200 years can be assigned to each period only under the supposition that during the early periods of history the growth of the human mind was more luxuriant than in later times ; while the late Dr. Haug, following the same method, fixed the very commencement of the Vedic literature between 2400—2000 B. C.,† by assigning about 500 years to each period, on the analogy of similar periods in the Chinese literature. It is therefore evident that this method of calculation, howsoever valuable

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* Pref. to Rig. Vol. IV., p vii.

† Introduction to the Aitareya Brâhmaṇa, p. 48. Prof. Whitney thinks that the hymns may have been sung as early as 2000 B. C. *Vide* Intro. to his Sanskrit Grammar, p. xiii. For a summary of the opinions of different scholars on this point see Kaegi's Rigveda translated by Arrowsmith, p. 110, note 39. The highest antiquity assigned is 2400 B. C.

it may be in checking the results arrived at by other methods, is, when taken by itself, most vague and uncertain. A further study of the different periods of the Vedic literature and its comparison with other ancient literatures. might hereafter help us to ascertain the duration of each period a little more accurately.* But I think we cannot expect, by this method alone, to be ever in a position to fix with any approach to certainty the correct age of the Vedas. Prof. Max Müller considers 200 years to be the minimum duration of each period, while Dr. Haug and Prof. Wilson thought that a period of 500 years was not too long for the purpose ;† and I believe there is hardly any inherent improbability if a third scholar proposes to extend the duration of each of these periods up to something like 1000 years. In the face of this uncertainty we must try to find out other means for ascertaining the correct age of the Vedas.

The Vedas, the Brâhmaṇas and the Sûtras contain numerous allusions and references to astronomical facts, and it was believed that we might be able to ascertain from them the age of the oldest literary relic of the Aryan race. But somehow or other the attempts of scholars to fix the age of the Vedas by what may be called the astronomical method, have not yet met with the expected success. Unfortunately for us, all the Sanskrit astronomical words that we now

* In a paper submitted to the Ninth Oriental Congress, Mr. Dhruvahas recently examined the whole Vedic literature with a view to ascertain its chronology, and he arrives at the conclusion that the duration assigned to the several periods of the Vedic literature by Prof. Max Müller is too short, and that "without making any guesses at numbers of years or centuries" we should at present be content with arranging the Vedic literature somewhat after the manner of the Geological strata or periods

† See Ait. Br. Intr., p. 48; also Pref. to Rig. Vol. IV., p. viii.

possess, except perhaps the Vedânga Jyotiṣha, belong to the later period of Sanskrit literature, when the Greek influence is perceptible in all its mathematical works. The different methods of astronomical calculations given in these works, the various eras that were established in India after Shâli-vâhana or Vikrama, the introduction of the Bârhaspatya cycle, and the adoption of the Greek division of the Zodiac, make it extremely difficult to correctly interpret the astronomical references in the later works; while the confusion, caused by the supposed absence of any definite statement as to the character of the year and the cycle mentioned in the Vedic works, renders it a hard task to deduce a consistent theory out of the various but stray references to astronomical facts in the Vedic literature. Take for instance the question of the commencement of the year in the Vedic calendar. There are grounds to hold that the ancient Aryas commenced their year either with spring or with autumn, at the equinoxes or at the solstices; * while the later astronomical works and systems furnish us with facts which go to prove that the year, in the different parts of India, commenced with almost all the different months of the year—Kârtika, Mârgashîrṣha, † Âṣhâḍha, Chaitra and Bhâdrapada. The discussion as to the number of the Nakshatras and different opinions as to their origin have further complicated the problem; while doubts have been raised as to the capacity of the Brâhmans in 1200 B.C. to make observations of solstitial points with astronomical accuracy.‡ I shall

* See *infra* Chap. II.

† Whitney's Sûrya Siddhânta xiv., 16, *n*.

‡ Pref. to Rig. Vol. IV., p. xxix. It is very difficult to understand on what grounds this assertion is made. Ancient Vedic bards had no mathematical instruments, but still they could have easily marked when day and night became equal in length.

have to examine hereafter how far some of these objections are tenable. For the present it is sufficient to state that in consequence of such doubts and objections, definite observations or allusions to astronomical events in the earliest works have been looked upon with suspicion by a good many Oriental scholars, while some have even condemned the astronomical method as inaccurate and conjectural.* It is, however, admitted that "if the astronomical date on which conclusions as to the age of the Veda have been built implied all that they were represented to imply, the earliest periods of Vedic poetry will have to be rearranged."†

It appears to me that scholars have erred too much on the side of overcautiousness in condemning this method. I do not mean to say that there are no difficulties; but sufficient care does not appear to have been taken to always keep in view the main point of the inquiry, by separating it from the mass of irrelevant matter, with which, in some cases, it becomes unavoidably mixed up. Some of Bentley's speculations, for instance, are indeed ingenious and suggestive, but he relies too much upon Purâṇic traditions, mere etymological speculations and his own calculations based thereon, instead of trying to find out whether there is anything in the earlier works to corroborate or support these traditions. On the other hand, Prof. Weber's Essay, which, as a collection of astronomical allusions and references in the Vedic literature, is extremely valuable, is taken up by the controversy as to the origin of the Nakshatras raised by M. Biot; and the same thing may be said of Prof. Whitney's contributions on the subject.‡ Various

* See Weber's History of Indian Literature, p. 2, note.

† Pref. to Rig. Vol. IV., p. lxxi.

‡ See his essay on the Hindu and Chinese systems of Asterisms.

other questions, such as whether the Vedic cycle comprised five or six years, how and when the intercalary days or months were inserted to make the lunar correspond with the solar year, have also caused the attention of scholars to be diverted from the broad astronomical facts and observations to be found recorded in the Vedic literature; and as a consequence we find that while the questions as to the original number of the Nakshatras and as to whether the Chinese borrowed them from the Hindus or *vice versâ*, are so ably discussed, no systematic attempt has yet been made to trace back the astronomical references in the later works to the Sanhitâs, and to fully examine their bearing on the question of the age and character of the Vedas. On the contrary, Prof. Weber asks us to reconcile ourselves to the fact that any such search will, as a general rule, be absolutely fruitless!* In the following pages I have endeavoured to shew that we need not be so much disappointed. In my opinion there is ample evidence—direct and circumstantial—in the earliest of the Sanhitâs, to fully establish the high antiquity assigned to the Indian literature on geographical and historical grounds.† I base my opinion mainly upon references to be found in the early Vedic works, the Sanhitâs and the Brâhmaṇas, and especially in the earliest of these, the Rigveda. For though later works may sometimes give the same traditions and references, yet any inference which is based upon them is likely to be regarded with more or less suspicion, unless we can show

* Weber's History of Indian Literature, p. 7.

† It is on these grounds that Prof. Weber believes that the beginnings of the Indian Literature "may perhaps be traced back even to the time when the Indo Aryans still dwelt together with the Persa-Aryans." Hist. Ind Lit., p. 5.

something in the earliest works themselves to justify that inference. Where the Sanhitâs and the Brâhmaṇas directly speak of the *actual* state of things in their time, there is, of course, no ground to disbelieve the same, but I think that even the traditions recorded in these works are more reliable than those in later works, for the simple reason that those traditions are there found in their purest form. Later works may indeed be used to supply confirmatory evidence, where such is available; but our conclusions must in the main be based on the internal evidence supplied by the Vedic works alone. Several Indian astronomers have worked more or less on the lines here indicated, but their labours in this direction have not unfortunately received the attention they deserve. The late Kṛishṇa Shâstri Goḍbole published his views on the antiquity of the Vedas in the second and third Volumes of the *Theosophist*,* and though he has failed to correctly interpret some astronomical allusions in the Vedic works, yet there is much that is suggestive and valuable in his essay. The late Prof. K. L. Chhatre also appears to have held similar views on the subject, but he has not published them, so far as I know, in a systematic form. My friend Mr. Shankara Bâlkṛishṇa Dikshit, who has written a prize essay in Marâthî on the history of Hindu Astronomy, and who has succeeded in correctly interpreting more verses in the Vedânga Jyotiṣha† than any other scholar has hitherto

* Also published as a separate pamphlet.

† Mr. Dikshit would do well to publish an English translation of at least the Chapter on Vedânga JyotiṢha in his essay. He has undoubtedly made a great advance over Weber and Thebaut in the correct interpretation of the treatise.

done, has also discussed this question in his essay, which I was allowed to read in MS. through his kindness. I am indebted to these scholars for some of the facts and arguments set forth in the following pages, and the present essay may, I think, be regarded as greatly developing, if not completing, the theory started by them.

CHAPTER II.

SACRIFICE alias THE YEAR.

Primitive calendar co-eval with the sacrificial system—Prajâpati = Yajna = *Samvatsara*—Civil or *sâvana* days—*Sâvana* and lunar months—Lunar and solar years—Intercalary days and months in Vedic times—Solar year was siderial and not tropical—Old beginning of the year and the sacrifice.—The Vishuvân day—Vernal equinox and winter solstice—Uttarâyaṇa and Dakshiṇâyana—Devayâna and Pitṛiyâna—Their original meaning—Bhâskarâchârya's mistake about the day of the Devas—The two year beginnings were subsequently utilised for different purposes.

It is necessary, in the first place, to see what contrivances were adopted by the ancient Aryas for the measurement and division of time. The present Indian system has been thus described by Professor Whitney in his notes to the Sûrya Siddhânta (i. 13, notes):—

"In the ordinary reckoning of time, these elements are "variously combined. Throughout Southern India (see "Warren's Kâla Sankalita, Madras, 1825, p. 4, etc.), the "year and month made use of are the solar, and the day the "civil; the beginning of each month and year being "counted, in practice, from the sunrise nearest to the "moment of their actual commencement. In all Northern "India the year is luni-solar; the month is lunar and is "divided into both lunar and civil days; the year is com-"posed of a variable number of months, either twelve or "thirteen, beginning always with the lunar month, of which "the commencement next precedes the true commencement "of the sidereal year. But underneath this division, the "division of the actual sidereal year into twelve solar months

" is likewise kept up, and to maintain the concurrence of
" the civil and lunar days, and the lunar and solar months,
" is a process of great complexity, into the details of which
" we need not enter here."

But the complications here referred to are evidently the growth of later times. The four ways of reckoning time, the Sâvana, the Chândra, the Nâkṣhatra and the Saura, are not all referred to in the early works, and even in later days all these measures of time do not appear to have been fully and systematically utilised. There is, as I have said before, no early work extant on Vedic calendar, except the small tract on Jyotiṣha, and our information about the oldest calendar must, therefore, be gathered either from stray references in the Vedic works or from the early traditions or practices recorded in the old sacrificial literature of India. There are several sacrificial hymns in the Rigveda, which show that the sacrificial ceremonies must then have been considerably developed ; and as no sacrificial system could be developed without the knowledge of months, seasons, and the year, it will not be too much to presume that in Vedic times there must have existed a calendar to regulate the sacrifices. It is difficult to determine the exact nature of this calender, but a study of the sacrificial literature would show that the phases of the moon, the changes in the seasons, and the southern and northern courses of the sun were the principal land-marks in the measurement of time in these early days. What is still more interesting, however, is that the leading features in the early sacrifices are the same as those in the year. The late Dr. Haug, in his introduction to the Aitareya Brâhmaṇa, has observed that " the *satras*, which lasted for one year, were nothing but an imitation of the sun's yearly course. They were divided

into two distinct parts, each consisting of six months of 30 days each. In the midst of both was the *Vishûvân*, *i. e.*, the equator or the central day, cutting the whole *satra* into two halves."* This clearly shows that the ancient Rishis prepared their calendar mainly for sacrificial purposes, and the performance of various sacrifices facilitated, in its turn, the keeping up of the calendar. Offerings were made every morning and evening, on every new and full moon, and at the commencement of every season and *ayana*. † When this course of sacrifices was thus completed, it was naturally found that the year also had run its course, and the sacrifice and the year, therefore, seem to have early become synonymous terms. There are many passages in the Brâhmaṇas and Sanhitâs, where *Samvatsara* and *Yajna* are declared to be convertible terms,‡ and no other theory has yet been suggested on which this may be accounted for. I am therefore inclined to believe that the Vedic Rishis kept up their calendar by performing the corresponding round of sacrifices on the sacred fire that constantly burnt in their houses, like the fire of the Parsi priest in modern times. The numerous sacrificial details, which we find so fully described in the Brâhmaṇas, might be later innovations,

* Ait. Br. Intr., p. 48.

† Cf. Baudhâyana Sutras, ii. 4.23, which describes the continuous round of sacrifices as follows :—अग्न्याधेयप्रभृत्यथेमान्यजस्राणि भवंति यथैतदग्न्याधेयमग्निहोत्रं दर्शपूर्णमासावाग्रयणमुदगयनदाक्षिणायनयोः पशुश्चार्तुर्मास्यान्यृतुमुखे षड्ढोता वसंते ज्योतिष्टोम इत्येवं क्षेमप्रापणम्। Also compare Manu iv. 25 26, and Yâjnavalkya i, 125,

‡ See Ait, Br, ii. 17, which says संवत्सरः प्रजापतिः। प्रजापतिर्यज्ञः। Also Ait. Br. iv. 22; Shatapatha Br. xi. 1. 1. 1; 2. 7. 1. In Taitt. San. ii. 5. 7. 3; vii. 5. 7. 4 we have यज्ञो वै प्रजापतिः, and again in vii. 2. 10. 3 संवत्सरः प्रजापतिः।

but the main idea of the yearly sacrifice appears to be an old one. The etymology of the word *ṛitvij* (*ṛitu+yaj* = season sacrificer) shows that even in the oldest days there existed a certain correspondence between the sacrifices and the seasons, and what is true of the seasons is true of the year which according to one derivation of *samvatsara* (*vas* = to dwell) is nothing but a period where seasons dwell, or a cycle of seasons.* The priests were not only the sacrificers of the community, but were also its time-keepers,† and these two functions they appear to have blended into one by assigning the commencement of the several sacrifices to the leading days of the year, on the natural ground that if the sacrifices were to be performed they must be performed on the principal days of the year.‡ Some scholars have suggested that the yearly *satras* might have been subsequently invented by the priests. But the hypothesis derives little support from the oldest records and traditions of all the sections of the Aryan race. Without a yearly *satra*

* Cf, Bhânu Dikshita's Com. on Amar a i, 4, 20, Dr. Schrader, in his Prehistoric Antiquities of the Aryan Peoples, Part iv., Ch. vi, (p. 305) also makes a similar observation. He holds, on philological grounds, that the conception of the year was already formedin the primeval period by combining into one whole the conception of winter and summer, which he believes to be the two primeval seasons.

† "In Rome the care of the calendar was considered a religious function, and it had from earliest times been placed in the hands of the pontiffs." Lewis's Historical Survey of the Astronomy of the Ancients. p. 24.

‡ "Plato states that the months and years are regulated in order that the sacrifices and festivals may correspond with the natural seasons ; and Cicero remarks that the system of intercalation was introduced with this object." Lewis's His. Astr. Anc., p. 19.

regularly kept up a Vedic Ṛiṣhi could hardly have been able to ascertain and measure the course of time in the way he did. When better contrivances were subsequently discovered the sacrifice might naturally become divested of their time-keeping function and the differentiation so caused might have ultimately led to an independent development of both the sacrifices and the calendar. It is to this stage that we must assign the introduction of the numerous details of the yearly sacrifice mentioned in later works ; and thus understood, the idea of a sacrifice extending over the whole year, may be safely supposed to have originated in the oldest days of the history of the Aryan race.* In fact, it may be regarded as coeval with, if not antecedent to, the very beginning of the calendar itself.

We have now to examine the principal parts of the year, *alias* the sacrifice. The *sâvana* or the civil day appears to have been, as its etymology shows,† selected in such cases as the natural unit of time. 30 such days made a month and 12 such months or 360 *sâvana* days made a year.‡ Comparative Philology, however, shews that the names

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* Comparative Philology also points to the same conclusion ; Cf. Sanskrit *yaj*, Zand *yaj*, Greek *ἅγος*. It is well-known that the sacrificial system obtained amongst the Greeks, the Romans and the Iranians.

† *Sâvana* is derived from *su* to sacrifice, and means literally a sacrificial day,

‡ Ait. Br. ii. 17; Taitt, San. ii, 5, 8. 3 ; Rig, i. 164. 48. Prof. Whitney (Sur. Sid. 13,*n*) observes. "The civil (*sâvana*) day is the natural day......A month of 30 and a year of 360 days are supposed to have formed the basis of the earliest Hindu Chronology, an intercalary month being added once in five years."

for the month and the moon coincide, with occasional small differences of suffix,* in most of the Indo-European languages, and we may therefore conclude that in the primitive Aryan times the month was determined by the moon. Now a month of thirty civil or *sâvana* days cannot correspond with a lunar synodical month, and the Brahmavâdins had therefore to omit a day in some of the *sâvana* months to secure the concurrence of the civil and the lunar months.† The year of 360 *sâvana* days was thus practically reduced to a lunar year of 354 civil days or 360 *tithis*. But a further correction was necessary to adjust the lunar with the solar reckoning of time. The zodiac was not yet divided into twelve equal parts, and the solar month, as we now understand it, was unknown. The commencement of the cycle of seasons was, therefore, the only means to correct the calendar, and the ancient Aryas appeared to have early hit upon the device of the intercalary days or month for that purpose. There are many passages in the Taittirîya and Vâjasaneyi Sanhitâs and also one in the Rigveda‡ wherein the intercalary month is mentioned, and though opinions may differ as to when and how it was inserted, we may, for the purpose of our present inquiry, regard it as undisputed that in the old Vedic days means were devised and adopted to secure

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* See Dr. Schrader's Prehistoric Antiquities of the Aryan Peoples, Part iv., Chap. vi. Translation by Jevons, p. 206. Also Max Müller's Biographies of Words, p. 193.

† उत्सृज्या३ं नोत्सृज्या३ंमिति मीमांसंते ब्रह्मवादिनः । Taitt. San. vii. 5. 7. 1., and Tâṇdya Br. v. 10. See also Kâla-Mâdhava Chap. on *Month*, Cal. Ed. p. 63.

‡ Taitt. San. i 4, 14; Vaj. San. 7. 70; Rig. i. 25. 8. As regards the twelve hallowed (intercalary) nights Cf. Rig. iv. 33. 7; Atha Veda iv. 11. 11; Taitt. Br. i. 1. 9. 10.

the correspondence of the lunar with the solar year. The occurrence of the twelve hallowed nights amongst the Teutons points to the same conclusion. They were in fact the supplementary days (366–354 = 12) required to balance the lunar with the solar year,—a period when the Ṛibhus, or the genii of the seasons, slackened their course and enjoyed the hospitality of the sun after toiling for a whole year (Rig. i. 33. 7.),* and when Prajâpati, the God of sacrifices, after finishing the old year's sacrifice, prepared himself for the new year's work (Atharva Veda iv. 11. 11.). The sacrificial literature of India still preserves the memory of these days by ordaining that a person wishing to perform a yearly sacrifice should devote 12 days (*dvâdashâha*) before its commencement to the preparatory rites. These facts, in my opinion, conclusively establish that the primitive Aryans had solved the problem involved in balancing the solar with the lunar year. There may be some doubt as to whether the concurrence of the two years was at first secured by intercalating twelve days at the end of every lunar year, or whether the days were allowed to accumulate until an intercalary month could be inserted. The former appears to have been the older method, especially as it has been utilised and retained in the performance of yearly sacrifices; but whichsoever may be the older method, one thing is certain, that primitive Aryas had contrived means for adjusting the lunar with the solar year. Prof. Weber and Dr. Schrader† appear to doubt the conclusion on the sole ground that we

* See Zimmer's Life in Ancient India, p. 366; Kaegi's Rigveda (translation by Arrowsmith), pp. 20, 37.

† See Indische Studien, xviii. 224, and Dr. Schrader's observations thereon in his Prehistoric Antiquities of Aryan Peoples, Part iv., Chap. vi., pp. 308—10.

cannot suppose the primitive Aryans to have so far advanced in civilization as to correctly comprehend such problems. This means that we must refuse to draw legitimate inferences from plain facts when such inferences conflict with our preconceived notions about the primitive Aryan civilization. I am not disposed to follow this method, nor do I think that people, who knew and worked in metals, made clothing of wool, constructed boats, built houses and chariots, performed sacrifices, and had made some advance in agriculture,* were incapable of ascertaining the solar and the lunar year. They could not have determined it correct to a fraction of a second as modern astronomers have done ; but a rough practical estimate was, certainly, not beyond their powers of comprehension. Dr. Schrader has himself observed that the conception of the year in the primeval period was formed by combining the conceptions of the seasons † If so, it would not be difficult, even for these primitive Aryans, to perceive that the period of twelve full moons fell short of their seasonal year by twelve days. Dr. Schrader again forgets the fact that it is more convenient, and hence easier and more natural, to make the year begin with a particular season or a fixed position of the sun in the heavens, than to have an ever-varying measure of time like the lunar year. Lewis, in his Historical Survey of the Astronomy of the Ancients, quotes Geminus to shew that " the system pursued by the ancient Greeks was to determine their months by the moon and their years by the sun,"‡ and

* For a short summary of the primitive Aryan civilization, see Peile's Primer of Philology, pp. 66, 67 ; also Kaegi's Rigveda, translated by Arrowsmith, pp. 11—20.

† See Preh. Ant. Ary. Peoples translated by Jevons, p. 305.

‡ Lewis, Hist. Surv. Astron. Anc., p. 18.

this appears to me to have been the system in force in the Indo-Germanic, or at any rate in the primitive Vedic period. There is no other conclusion that we can fairly draw from the facts and passages noted above.

There is, however, a further question, as to whether the solar year, with reference to which these corrections were made, was tropical or sidereal. It is true that the great object of the calender was to ascertain the proper time of the seasons. But the change in the seasons consequent upon the precession of the equinoxes is so exceedingly minute as to become appreciable only after hundreds of years, and it is more probable than not that it must have escaped the notice of the early observers of the heavens, whose only method of determining the position of the sun in the ecliptic was to observe every morning the fixed stars nearest that luminary.* Under such a system the year would naturally be said to be complete when the sun returned to the same fixed star. Prof. Whitney has pointed out that the same system is followed in the Sûrya Siddhânta, though the motion of the equinoxes was then discovered.† It is, therefore, natural to presume that the early Vedic priests were ignorant of the motion of the equinoxes. No early work makes any mention of or refers to it either expressly or otherwise; and the solar year mentioned in

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* Taitt. Br. i. 5. 2. 1; यत्पुण्यं नक्षत्रं तद्बदकुर्वीतोपव्युषम् । यदा वै सूर्य उदेति । अथ नक्षत्रं नैति । यावति तत्र सूर्यो गच्छेत् । यत्र जघन्यं पश्येत् । तावत्कुर्वीत यत्कारी स्यात् । पुण्याह एव कुरुते । This is still recited at the Puṇyâha-vâchana ceremony.

† Sur. Sid. i. 13. *n.* "It is, however, not the tropical solar year which we employ, but the sidereal, no account being made of the precession of the equinoxes."

the Vedic works must, therefore, be considered as sidereal and not tropical. This would necessitate a change in the beginning of the year, every two thousand years or so, to make it correspond with the cycle of natural seasons, and the fact that such changes were introduced twice or thrice is a further proof of the old year being a sidereal one.* The difference between the sidereal and the tropical year is 20·4 minutes, which causes the seasons to fall back nearly one lunar month in about every two thousand years, if the sidereal solar year be taken as the standard of measurement. When these changes and corrections came to be noticed for the first time, they must have created a great surprise, and it was not till after one or two adjustments on this account were made that their true reason, the motion of the equinoxes, could have been discovered. Garga tells us that if the sun were to turn to the north without reaching Dhanishṭhâ,† it foretold great calamity, and I am disposed to put a similar interpretation upon the story of Prajâpati *alias* Yajna *alias* the year, who, contrary to all expectations, moved backwards to his daughter Rohiṇi.‡ But as I wish to examine the tradition more fully hereafter, it is not necessary to dilate on the point here. My object at present is to show that the Vedic solar year was sidereal and not tropical, and what has been said above is, I believe,

* The Krittikâs once headed the list of the Nakshatras, which now begins with Ashvinî. Other changes are discussed in the following chapters of this work.

† Garga quoted by Bhaṭṭotpala on Bṛihat. San. iii. 1 :—

यदा निवर्ततेऽप्राप्तः श्रविष्ठामुत्तरायणे ।
आश्लेषां दक्षिणेऽप्राप्तस्तदा विद्यान्महाभयम् ॥

‡ Ait. Br. iii. 33. The passage is discussed in this light further on in Chapter VIII. See also Shat. Br. i. 7. 4. 1.

sufficient to justify such a presumption, at least for the present, though it may afterwards be either retained or discarded, according as it tallies or jars with other facts.

Opinions differ as to whether the lunar month began with the full or the new moon,* and whether the original number of Nakshatras was 27 or 28. † But I pass over these and similar other points as not very relevant to my purpose, and take up next the question of the commencement of the year. I have already stated that the sacrifice and the year were treated as synonymous in old days, and we may, therefore, naturally expect to find that the beginning of the one was also the beginning of the other. The Vedânga Jyotiṣha makes the year commence with the winter solstice, and there are passages, in the Shrauta Sûtras which lay down that the annual sacrifices like *gavâm-ayana*, should be begun at the same time. ‡ A tradition has also been recorded by Jaimini and others that all *Deva* ceremonies should be performed§ only during the Uttarâyaṇa ; and the Uttarâyaṇa, according to the several Jyotiṣha works,|| is the period of the year from the winter to the summer solstice,

* See Kâla Mâdhava, Chapter on *Month*, Cal. Ed., p. 63; पौर्णमास्यं-तत्वे श्रुतेः कटाक्षो भूयान् । We can thus explain why the *full moon* night of a month was described as the *first* night of the year. See *infra*.

† Pref. to Rig., Vol. IV., and Whitney's Essay on the Hindu and Chinese Asterisms.

‡ See Ved. Jy. 5; Ashvalâyana Shr. Su. i. 2. 14. 1; ii. 2. 14, 3 and 22; Kât. Shr. Su. v. 1. 1.

§ Mîmânsâ Darshana, vi. 8. 5. Ashvalâyana, Gr. Su. i. 4. 1, Shatapatha, Br. xiv. 9. 3.1 The last quoted in Kâla Mâdhava, Chapter on *Ayana*, Cal. Ed., p. 57, but from the Kâṇva recension thus: उदगयने आपूर्यमाणपक्षस्य पुण्याहे द्वादशाहमुपसद्व्रती भूत्वा ।

|| Sur. Sid, xiv. 10 ; Ved. Jy. 5.

that is, from the time when the sun turns towards the north till it returns towards the south. This leads one to suppose that the winter solstice was the beginning of the year and also of the Uttarâyaṇa at the time when the annual sacrifices were established, and therefore in the old Vedic days. But a closer consideration of the ceremonies performed in the yearly *satras* will show that the winter solstice could not have been the original beginning of these *satras*. The middle day of the annual *satra* is called the Vishûvân day, and it is expressly stated that this central day divides the *satra* into two equal halves, in the same way as the Vishûvân or the equinoctial day divides the year.* The *satra* was thus the imitation of the year in every respect, and originally it must have corresponded exactly with the course of the year. Now, as *Vishûvân* literally means the time when day and night are of equal length, if we suppose the year to have at the time commenced with the winter solstice, the Vishûvân or the equinoctial day could never have been its central day, and the middle day of the *satra* would correspond, not with the equinoctial, as it should, but with the summer solstice. It might be urged that *Vishûvân* as referring to the *satra* should be supposed to be used in a secondary sense. But this does not solve the difficulty. It presupposes that *Vishuvân* must have been used at one time in the primary sense (*i. e.*, denoting the time when day and night are equal), and if in its primary sense it was not used with reference to the *satra*, it must have been so used at least with reference to the year. But if *Vishûvân* was thus the central day of the year, the year must have once commenced with the equinoxes. The word

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* Ait. Br. iv. 22; Taitt. Br. i. 2. 3. 1; Tân. Br. iv. 7. 1.

uttarâyaṇa is again susceptible of two interpretations. It may mean "turning towards the north from the southernmost point," or it may indicate "the passage of the sun into the northern hemisphere, *i. e.*, to the north of the equator." If we adopt the first meaning, the Uttarâyaṇa and the year must be held to commence from the winter solstice, while if the second interpretation be correct, the Uttarâyaṇa and the year must have once commenced with the vernal equinox. The facts, that the central day of the annual *satra* was called *vishuvân*, that Vasanta or spring was considered to be the *first* of the seasons,* and that the *âgrayaṇeshṭis* or the half-yearly sacrifices were required to be performed every Vasanta (spring) and Sharad (autumn) † clearly shew that the second of the two interpretations given above is more likely to be the older one. Let us, however, examine the point more fully.

The only passages where *uttarâyaṇa* is mentioned in the Vedic works are those wherein the white and the black paths for the souls of the deceased, the Devayâna and the Pitṛiyâna, are described. The words *devayâna* and *pitṛiyâna* occur several times in the Rigveda. Agni is said to know both these;‡ while in the Vâjasaneyi Sanhitâ 19. 47, these are said to be the two paths open to mortals. In the Rigveda x. 18, 1, the path of the god of Death is said to be the reverse of *devayâna*, and in the Rigveda x. 98. 11, Agni is said to know *devayâna* by seasons.§ There is, however,

* Taitt. Br. i. 1. 2. 6. मुखं वा एतदृतूनां यद्वसंतः । Upon this the author of Kâla Mâdhava observes संवत्सरोपक्रमरूपत्वेन वसंतस्य प्राथम्यं द्रष्टव्यम् । Cal. Ed., p. 59.

† Ashvalâyana Shr. Sut. i. 2. 9. 3-4.

‡ See Rig. i. 72. 7. and x 2. 7.

§ विद्वान्पथ ऋतुशो देवयानान् । Sâyaṇa, however, takes ऋतुशः with the very धेहि. But query ?

no passage in the Rigveda where *devayâna* is fully defined and we have consequently to refer to the passages in the Brihadâranyaka and the Chhândogya Upanishad * for a fuller explanation of these terms. Before the idea was recorded in these works it must undoubtedly have received considerable additions, but nevertheless the original sense cannot be supposed to have been completely lost in these later additions. It is therefore extremely important to see how these two paths are described in the Brahmaṇas and Upanishads. Brih. vi., 2, 15 and Chh. iv. 15.5 state that "flame, day, the increasing moon, the six months when the sun is towards the north, the *devaloka* (Chh. *devapatha*) or the abode (Chh. *patha*) of gods, &c.," † is the way never to return; while "smoke, night, the decreasing moon, and the six months when the sun is towards the south, the *pitṛiloka* or the abode of Pitṛis" is the reverse. In the Bhagavad Gîtâ viii. 24, 25 we find the same sentiments in modern phraseology, and the question is, what is meant by the phrase "the six months when the sun is towards the north" or, as Yâska and the Gîtâ have it, "the six months ‡ of the

* See also Yâskas Nirukta 14. 9; Mahânârayaṇopanishad 25. I; and Shankarâchârya's Bhâshya on Brahma Sutras iv. 2. 18—21, where all such passages are collected and discussed

†आर्चिषोहरन्ह आपूर्यमाणपक्षमापूर्यमाणपक्षाद्यान्षण्मासानुदङ्ङादित्य एति मासेभ्यो देवलोकं...तेषां न पुनरावृत्तिः। धूमाद्रात्रिं रात्रेरपक्षीयमाणपक्ष-मपक्षीयमाणपक्षाद्यान्षण्मासान् दक्षिणादित्य एति मासेभ्यः पितृलोकम्...। Bṛihadâr. vi. 2. 15. Instead of "six months when sun goes north and south," Yâska and Mahânâ use the words उदगयन and दक्षिणायन while in Chh. we have देवपथ instead of देवलोक in Bribad, In Kaus. i. 3, it is called देवयान.

‡ अग्निर्ज्योतिरहः शुक्लः षण्मासा उत्तरायणम्। Gitâ viii. 24.

Uttarâyana." Almost all the commentators have interpreted the expression to mean the six months from the winter to the summer solstice.* Bnt notwithstanding their high authority it will be found that their interpretation, though in consonance with the later astronomical views, is directly opposed to the passages in the Vedic works. In the Taittiriya Sanhitâ vi. 5. 3, we are told "the sun, therefore, goes by the south for six months and six by the north." But this does not help us in ascertaining the correct meaning of the phrase "by the north." As it stands it may mean either the solstitial or the equinoctial six months. We must therefore look for another passage, and this we find in the Shatapatha Brâhmana (ii. 1. 3, 1-3), where in describing the two aforesaid paths it lays down in distinct terms that Vasanta, Grishma and Varshâ are the seasons of the Devas; Sharad, Hemanta and Shishira those of the Pitris ; the increasing fortnight is of the Devas ; the decreasing one of the Pitris : the day is of the Devas ; the night of the Pitris : again the first part of the day is of the Deva ; the latter of the Pitris.......... When he (the sun) turns to the north, he is amongst the Devas and protects them ; when he turns to the south he is amongst the Pitris and protects them."†

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*Shankarâchârya is not explicit ; yet his reference to the death of Bhîshma shows that he takes the same view. Ânandgiri on Prashnopanishad i. 9, says ज्येष्ठादिर्दक्षिणायनम् ।

†As the passage is important I give it here in full:—

वसंतो ग्रीष्मो वर्षा । ते देवा ऋतवः शरद्धेमंतः शिशिरस्ते पितरो य एवापूर्यतेऽर्धमासः स देवा योऽपक्षीयते स पितरोऽहरेव देवा रात्रिः पितरः पुनरन्हः पूर्वाण्हो देवा अपराण्हः पितरः । ...... । स यत्र उदगावर्तते देवेषु तर्हि भवति देवांस्तर्ह्यभिगोपायत्यथ यत्र दक्षिणावर्तते पितृषु तर्हि भवति पितृंस्तर्ह्यभिगोपायति ।

This removes all doubts as to what we are to understand by *devayâna*, *devapâtha*, or *devaloka* and *uttarâyana* as connected with it. The Brihadâranyaka Upanishad is a part of the Shatapatha Brâhmaṇa, and we shall not be violating any rule of interpretation if we interpret the passage in the one in the light of a similar passage in the other. Now if Vasanta (spring), Grîshma (summer) and Varshâ (rains) were the seasons of the Devas and the sun moved amongst the Devas when he turned to the north, it is impossible to maintain that the Devayâna or the Uttarâyaṇa ever commenced with the winter solstice, for in neither hemisphere the winter solstice marks the beginning of spring, the first of the Deva seasons. The seasons in Central Asia and India differ. Thus the rains in India commence about or after the summer solstice, while in the plains of Asia the season occurs about the autumnal equinox. But in neither case Vasanta (spring) commences with the winter solstice or Varshâ (rains) ends at the summer solstice. We must therefore hold that *Devayâna* in those days was understood to extend over the six months of the year, which comprised the three seasons of spring, summer, and rains, *i. e.*, from the vernal to the autumnal equinox, when the sun was in the northern hemisphere or to the north of the equator. This shows further that the oldest order of seasons did not place Varshâ (rains) at the summer solstice, when the chief Indian monsoon commences; but at the autumnal equinox. The winter solstice, according to this order, falls in the middle of Hemanta. In the modern astronomical works, the winter solstice is, however, placed at the end and not in the middle of Hemanta, while the vernal equinox is said to fall in the middle of Vasanta. When the Vedic Aryas became

settled in India, such a change in the old order of seasons was necessary to make them correspond with the real aspect of nature. But it is difficult to determine exactly when this change was made.* The old order of seasons given in the passage above quoted, however, clearly states that Vasanta in old days commenced with the vernal equinox. We can now understand why Vasanta has been spoken of as the first season and why the Nakshatras have been divided into two groups called the Deva Nakshatras and the Yama Nakshatras.† I am aware of the theory which attempts to explain away the passages above cited as metaphorical to avoid the appearance of superstition.‡ But the method is neither sound nor necessary. The path of the Devas and the path of the Pitṛis are several times referred to in the Rigveda, and though we might suppose the Brahmavâdins to have developed the two ideas to their utmost extent, it cannot be denied that the original idea is an old one, suggested by the passage of the sun in the northern and southern hemispheres.

In the absence of anything to the contrary we might therefore take it as established that in the early Vedic days the year began when the sun was in the vernal equinox; and as the sun then passed from the south to the north of the equator it was also the commencement of his northern passage. In other words, the Uttarâyaṇa (if such a word was then used), Vasanta, the year and the *Satras* all commenced together at the vernal equinox. The autumnal equinox which came after the rains was the central day of

* See Zimmer's Life in Ancient India p. 371. Kaegi's Rigveda, p. 116, note 68.

† Taitt. Br. i. 1. 2. 6 and i. 5. 2. 6.

‡ See Thomson's Bhagavad Gitâ, p. 60.

the year; and the latter half of the year was named the Pitriyâna or what we would now call the Dakṣhiṇâyana. It is difficult to definitely ascertain the time when the commencement of the year was changed from the vernal equinox to the winter solstice. But the change must have been introduced long before the vernal equinox was in the Krittikâs, and when this change was made *uttarâyaṇa* must have gradually come to denote the first half of the new year, *i. e.*, the period from the winter to the summer solstice, especially as the word itself was capable of being understood in the sense of "turning towards the north from the southernmost point," I am of opinion, however, that *devayâna* and *pitṛiyâna*, or *devaloka* and *pitṛiloka* were the only terms used in the oldest times. It is a natural inference from the fact that the word *uttarâyaṇa*, as such, does not occur in the Rigveda. The fact, that Vishûvân was the central day of the yearly *satra*, further shows that the sacrificial system was coeval with the division of the year into the paths of Devas and Pitṛis. After a certain period the beginning of the year was changed to the winter solstice, and it was sometime after this change was made that the words *uttarâyaṇa* and *dakṣhiṇâyana* came to be used to denote the solstitial divisions of the year. But *devayâna* and *pitṛiyâna* could not be at once divested of the ideas which had already become associated with them. Thus while new feasts and sacrifices came to be regulated according to *uttarâyaṇa* and *dakṣhiṇâyana*, *devayâna* and *pitṛiyâna* with all the associated ideas continued to exist by the side of the new system, until they became either gradually assimilated with the new system or the priests reconciled the new and the old systems by allowing option

to individuals to follow whichever they deemed best. We must therefore take great care not to allow the idea of *uttarâyaṇa*, as we now understand it, to obscure our vision in interpreting the early Vedic traditions, and that too much care can never be taken is evident from the fact that even so acute an astronomer as Bhâskarâchârya was at a loss to correctly understand the tradition that the Uttarâyaṇa was the day of the Devas. In his Siddhânta Shiromaṇi he raises the question how the Uttarâyaṇa, as it was generally understood in his day, could be the day of the Devas. He admits that the celestial beings on Meru at the North Pole behold the sun (during all the six months) when he is in the northern hemisphere (vii. 9) and these six months may therefore be properly called their day.* But the word *uttarâyaṇa* was then used to denote the period of six months from the winter to the summer solstice; and Bhâskarâchârya was unable to understand how such an Uttarâyaṇa could be called the day of the Devas by the writers of the astronomical Sanhitâs. If the sun is visible to the Gods at Meru from the vernal equinox to the summer solstice, its passage back to the autumnal equinox lies through the same latitudes and in that passage, *i. e.*, during three months after the summer solstice, the sun must, says Bhâskarâchârya, be visible to the Gods. But according to the Sanhitâ-writers the day of the Devas ended with the Uttarâyaṇa, that is, as Bhâskara understood

* In the Surya Siddhânta xii. 67 it is said that "At Meru Gods behold the sun, after but a single rising, during the half of his revolution beginning with Aries;" while in xiv. 9. the Uttarâyaṇa is said to commence "from the sun's entrance into Capricorn." The author, however, has not noticed the tradition that the Uttarâyana is the day of the Devas and the apparent inconsistency arising therefrom. Perhaps he understood the tradition in its true sense.

the word, at the summer solstice. How is this conflict to be reconciled? Bhâskarâchârya could give no satisfactory solution of the difficulty, and asks his readers to reconcile the conflicting statements on the supposition that the doctrine may be regarded as referring to "judicial astrology and the fruits it foretells."* Had Bhâskarâcharya however known that the word *uttarâyana* was sometimes used for *devayâna* to denote the passage of the sun from the vernal to the autumnal equinox, I am sure, he would not have asked us to be satisfied with the lame explanation that the doctrine of the Sanhitâ-writers need not be mathematically correct as it refers exclusively to judicial astrology. It is difficult to say whether the ancient Aryas ever lived so near the north pole as to be aware of the existence of a day extending over at least two or three if not six months of the year. But the idea that the day of the Devas commences when the sun passes to the north of the equator, appears to be an old one. In the Taittirîya Brâhmaṇa† iii. 9. 22. 1.

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*The original verses are as follows:

दिनं सुराणामयनं यदुत्तरं निशेतरत्सांहितिकैः प्रकीर्तितम् ।
दिनोन्मुखेऽर्के दिनमेव तन्मतं निशा तथा तत्फलकीर्तनाय तत् ॥
द्वन्द्वांतमारोहति यैः क्रमेण तैरेव वृत्तैरवरोहतीनः ।
यत्रैव दृष्टः प्रथमं स देवैस्तत्रैव तिष्ठन् न विलोक्यते किम् ॥

Golâdhyâya vii. 11-12, Bâpudevashâstri's Ed. pp 304, 5,

†एकं वा एतद्देवानामहः । यत्संवत्सरः । It is however extremely hazardous to base any theory upon this. Traditions like these have been cited as indicating the fact the North Pole was inhabited in old days! Similar other traditions are said to indicate the existence of a pre glacial period. Is it not more probable to suppose that when *uttarâyana* and *dakshinâyana* came to be first distinguished, they were respectively named 'day' and 'night' with a qualifying word to mark their special nature? The history of languages shews that when people come across new ideas they try to name them in old words. The Uttarâyaṇa and the Dakshinâyaṇa may have been thus conceived as God's day and night. See *infra.* Chap. V.

we are told that the year is but a day of the Devas and even Herodotus (400 B. C.) mentions a people who sleep during the six months of the year.* If the tradition is, therefore, as old as it is represented to be, it is impossible to reconcile it with the later meaning of *uttarâyana* as commecing from the winter solstice and this would then furnish an additional ground to hold that in early times the Uttarâyana began with the vernal equinox as stated in the Shatapatha Brâhmaṇa.

I have stated above that when the commencement of the year was altered from the vernal equinox to the winter solstice, *uttarâyana* either lost its older meaning or was rather used to denote the solstitial division of the year. But this is not the only consequence of that change. With the year the beginning of the annual *satras* was also gradually transferred to the winter solstice and the change was complete when the Taittirîya Sanhitâ was compiled. In fact had it not been for the passage in the Shatapatha Brâhmana it would have been impossible to produce any direct evidence of the older practice. When the beginning of the *satra* was thus changed, the Vishûvân day must have gradually lost its primary meaning and come to denote simply the central day of the yearly *satra*.

The old practice was not however completely forgotten and for the purpose of the Nakshatra-sacrifices the vernal equinox was still taken as the starting point. Thus it is that Garga tells us that "of all the Nakshatras the Krittikâs are said to be the first for sacrificial purposes and Shraviṣhṭhâ for (civil) enumeration."† But even this distinction

*Quoted in Narrien's Origin and Progress of Astronomy, p. 31.
†Quoted by Somâkara on Ved. Jy. 5. तेषां च सर्वेषां नक्षत्राणां कर्मसु कृत्तिकाः प्रथममाचक्षते श्रविष्ठा तु संख्यायाः।

appears to have been eventually lost sight of by the later writers and all references to *uttarâyaṇa* were understood to be made solely to the six months from the winter to the summer solstice, an error from which even Bhâskarâchârya did not escape, though he perceived the absurdity caused by it in some cases. At the present day we on the southern side of the Narmadâ begin the year at the vernal equinox for all *civil* purposes, but still all the *religious* ceremonies prescribed to be performed in the Uttarâyaṇa, are performed during the Uttarâyaṇa beginning with the winter solstice, a position quite the reverse of that described by Garga. When we at the present day have been thus using the system of a double year-beginning, we need not be surprised if the ancient Aryas, after shifting the commencement of the year to the winter solstice, managed to keep up the old and the new system together by assigning the different beginnings of the year to different purposes as indicated by Garga. It was the only alternative possible if nothing old was to be entirely given up.

CHAPTER III.

THE KṚITTIKÂS.

Nakshatras in old Vedic times generally mean asterisms and not zodiacal portions—The present and the older position of the solstices —In later works—In Vedânga Jyotisha—An objection against its antiquity examined—Passages in the Taittirîya Sanhitâ and Brâhamaṇa—The Kṛittikâs head the Nakshatras—Deva and Yama Nakshatras—Their real meaning—Taittirîya Sanhitâ vii. 4. 8. discussed—Jaimini's and Shabara's interpretation of the same—Conclusions deducible therefrom—Winter solstice in Mâgha—Vernal equinox in the Kṛittikâs—The age of the Sanhitâ—2350 B. C.—Bentley's arguments and views criticised.

We have seen that the ancient Aryas originally commenced their year, which was luni-solar and siderial, with the vernal equinox, and that when the beginning was changed to the winter solstice both the reckonings were kept up, the one for sacrificial and the other for civil purposes. Let us now examine if there is any reliable evidence to show that the Vedic priests made any corrections in the calendar when by the precession of the equinoxes the cycle of seasons gradually fell back. All our present calendars are prepared on the supposition that the vernal equinox still coincides with the end of Revatî and our enumeration of the Nakshatras begins with Ashvinî, though the equinox has now receded about 18° from Revatî. It has been shown by Prof. Whitney (Sûrya Siddhânta, viii., 9 note, p. 211) that the above position of the vernal equinox may be assumed to be true at about 490 A. D Taking this as the probable date of the introduction of the present system, we have now to see if we can trace back the position of the vernal equinox amongst the fixed circle of stars. The question, so far, as

one antecedent stage is concerned, has been thoroughly discussed by Colebrooke, Bentley, Max Müller, Weber, Whitney, Biot, and other scholars: and I shall therefore only summarise what they have said, noting the points where I differ from them. I do not propose to enter into any detailed mathematical calculations at this stage of the inquiry, for I am of opinion that until we have thoroughly examined and discussed all the passages in the Vedic works bearing on this question, and settled and arranged our facts, it is useless to go into minute numerical calculations. The Vedic observations could not again be such as need any minute or detailed arithmetical operations. I shall therefore adopt for the present the simplest possible method of calculation,—a method which may be easily understood and followed by any one, who can watch and observe the stars after the manner of the ancient priests. We shall assume that the zodiac was divided into 27 parts, not by compass but by means of the leading stars, which Prof. Max Müller rightly calls the milestones of the heavens. The Vedic priest, who ascertained the motion of the sun by observing with his unaided eye the nearest visible star,* cannot be supposed to have followed a different method in making other celestial observations; and, if so, we cannot assume that he was capable of recognizing and using for the purposes of observation any artificial divisions of the ecliptic on a mathematical principle, such as those which would result from the division of 360° of the zodiac into 27 equal parts, each part thus extending over 13° 20′ of the ecliptic. Of course, such an artificial method might be easily followed in

* Taitt. Br. i. 5. 2. 1, previously quoted. The passage is very important as it describes the method of making celestial observations in old times.

later days, when the means of observation increased and the science of arithmetic was developed. But in the earliest days of civilization, it is more natural to suppose that the motions of the sun and the moon were determined by observing which of the known fixed stars was nearest to them. When we, therefore, find it stated in the Vedic works that the sun was in the Krittikâs, it is more probable that the fixed asterism, and not the beginning of the artificial portion of the zodiac, was intended. I admit that the accuracy of such observations cannot be relied upon within two or three degrees, if not more. But we must take the facts as they are, especially when it is impossible to get anything more accurate from the ancient observers of the heavens.* It will, I trust, however, be found that this inevitable want of accuracy in the old observations does not affect our conclusions to such an extent as to make them practically useless for chronological purposes. For instance, suppose that there is a mistake of 5° in observing the position of the sun with reference to a fixed star when the day and the night are of equal length. This would cause an error of not more than $5 \times 72 = 360$ years in our calculations ; and in the absence of better means there is no reason to be dissatisfied even with such a result, especially when we are dealing with the remotest periods of antiquity. I shall, therefore, assume that references to the Nakshatras in the old Vedic works, especially in cases where the motions of other bodies are referred to them, are to the fixed

*Similar observations have been recorded by Greek poets. Homer mentions 'the turns of the sun,' and Hesiod 'the rising and the setting of the Pleiades at the beginnings of day and night.' The observations in the Vedic works may be supposed to have been made in a similar way.

asterisms and not to the zodiacal portions. I may also state here that as a change in the position of the vernal equinox necessarily causes a similar change in the position of the winter solstice, both the beginnings of the year, previously referred to, would require to be simultaneously altered. Whenever, therefore, we find a change in the position of the vernal equinox recorded in the early works, we must look for the evidence of a corresponding alteration in the position of the winter solstice, and the corroborative evidence so supplied wlll naturally add to the strength of our conclusions. This will, I hope, sufficiently explain the procedure I mean to follow in the investigation of the problem before us. I shall now proceed to examine the passages which place the vernal equinox in the Krittikâs, beginning with the latest writer on the subject.

It is now well-known that Varâhamihira, in whose time the vernal equinox coincided with the end of Revati and the summer solstice was in Punarvasû, distinctly refers in two places to the older position of the solstices recorded by writers who preceded him. "When the return of the sun took place from the middle of Âshleṣhâ," says he in his Pancha Siddhântikâ, "the tropic was then right. It now takes place from Punarvasû."* And, again, in the Brihat Sanhitâ iii., 1 and 2, he mentions the same older position of both the solstitial points and appeals to his readers to ascertain for themselves by actual observation which of the two positions of the solstices is the correct one, whether the older position of the

*See Colebrooke's Essays, Vol. II., p. 387. The verse may now be found in Dr. Thibaut's edition of the work. It is as follows:—

आश्लेषार्धांदासीद्यदा निवृत्तिः किलोष्णकिरणस्य ।
युक्तमयनं तदासीत्सांप्रतमयनं पुनर्वसुतः ॥

solstices or that given by the writer.* It is clear, therefore, that in the days of Varāhamihira, there existed works which placed the winter solstice in the beginning of (divisional) Dhanishthâ and the summer solstice in the middle of Ashleṣhâ. This statement of Varāhamihira is fully corroborated by quotations from Garga† and Parâshara which we meet with in the works of the later commentators; and it appears that the system of commencing the year with the month of Mâgha, which corresponds with the above position of the solstices, was once actually in vogue. Amarasinha states that the seasons comprise two months each, beginning with Mâgha, and three such seasons make an *ayana*.‡ The same arrangement of seasons is also mentioned in the medical works of Shushruta and Vâgbhaṭa.§ The account of the death of Bhîshma, related in the Mahâbhârata Anushâshana-parva 167, further shows that the old warrior, who possessed the superhuman power of choosing his time of death, was waiting on his death-bed for the return oi the sun towards the north from the winter

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*Thus :—

आश्लेषार्धाद्दक्षिणमुत्तरमयनं रवेर्धनिष्ठाद्यम् ।
नूनं कदाचिदासीद्येनोक्तं पूर्वशास्त्रेषु ॥
सांप्रतमयनं सवितुः कर्कटकाद्यं मृगादितश्चान्यत् ।
उक्ताभावो विकृतिः प्रत्यक्षपरिक्षणैर्व्यक्तिः ॥

† Garga, quoted by Somâkara on Ved. Jy. 5, says :—

यदा माघस्य शुक्लस्य प्रतिपद्युत्तरायणम् ।
सहोदयं श्रविष्ठाभिः सोमार्कौ प्रतिपद्यतः ॥

Bhattotpala on Brihat. San. iii. 1, quotes Garga as follows:—

श्रविष्ठाद्यात्पौष्णार्धं चरतः शिशिरः ।

‡ Amara i. 4. 13 द्वौ द्वौ माघादिमासौ स्यादृतुस्तैरयनं त्रिभिः ।

§ See Shushruta i. 6, and Vâgbhata's Ashtângahṛidaya Sutrasthâna iii. 2; both of which are quoted further on in Chap. IV.

solstice and that this auspicious event took place in the first half of the month of Mâgha.* It is evident from this that the winter solstice must have coincided in those days with the beginning of Dhanishṭhâ as described in the Vedânga Jyotiṣha and other works.

There is thus sufficient independent evidence to show that before the Hindus began to make their measurements from the vernal equinox in Revatî there existed a system in which the year commenced with the winter solstice in the month of Mâgha and the vernal equinox was in the last quarter of Bharaṇî or the beginning of the Kṛittikâs.† We need not, therefore, have any doubts about the authenticity of a work which describes this older system and gives rules of preparing a calendar accordingly. Now this is what the Vedânga Jyotiṣha has done. It is a small treatise on the Vedic calendar, and though some of its verses still remain unintelligible, yet we now know enough of the work to ascertain the nature of the calculations given therein. It was once supposed that the treatise mentions the *Râshis*,

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* Mah. Anu. 167, 26 and 28 :—

परिवृत्तो हि भगवान्सहस्रांशुर्दिवाकरः ॥२६॥

. . . .

माघोऽयं समनुप्राप्तः मासः सौम्यो युधिष्ठिर ।
त्रिभागशेषः पक्षोऽयं शुक्लो भवितुमर्हति ॥२८॥

Lele, Modak, Ketkar and other Hindu astronomers have recently tried to determine the date of the Mahâbhârata war from such references, and they hold that the vernal equinox was then in the Kṛittikas.

† Prof. Max Müller has pointed out that in the Atharva Veda i. 19. 7 and in the Yâjnavalkya Smṛiti i. 267, the Kṛittikas occupy their early position, while the Vishṇu Purâṇa actually places the vernal equinox in the Kṛittikas. See Pref. to Rig., Vol. IV., p. xxxi.

but a further study of the work has shown that though the word *Râshi* occurs in some of its verses, it is there used in a totally different sense. This work gives the following positions of the solstices and the equinoxes :—*

1. The winter solstice in the beginning of Shravishṭhâ, (divisional) ;
2. The vernal equinox in 10° of Bharaṇî ;
3. The summer solstice in the middle of Âshleshâ, and—
4. The autumnal equinox in 3 20′ of Vishâkhâ.

The first year of the cycle commenced with the winter solstice* when the sun and the moon were together at the beginning of Dhanishṭhâ and the Uttarâyaṇa also began at the same time. There is very little else in the Vedânga Jyotisha that may help us in our present inquiry except the fact that the enumeration of the deities presiding over the various Nakshatras begins with Agni, the presiding deity of the Krittikâs†. From these data astronomers have calculated that the solstitial colure occupied the position above mentioned between 1269 B. C. to 1181 B. C., according as we take the mean rate of the precession of the equinoxes 50″ or 48″·6 a year.‡

Some scholars, however, have boldly raised the question, what authority is there to hold that the position of the solstitial colure was recorded in the Vedânga Jyotisha from

* See Ved. Jy. Verse 5.—

प्रपद्येते श्रविष्ठादौ सूर्याचंद्रमसावुदक् ।
सार्पार्धे दक्षिणार्कस्तु माघश्रावणयोः सदा ॥

† Cf. Ved. Jy. Verse 25. अग्निः प्रजापतिः सोमो &c.,

‡ See the late Krishṇashâstri Godbole's Essay on the Antiquity of the Vedas., p. 18 ; also Pref. to Rig., Vol. IV., p. xxviii.

actual observation? It is conceded that the position of the solstitial colure might have been incorporated in the Jyotisha from real traditional information, but it is at the same itme contended that the language of the treatise and the methods given therein create doubts about the antiquity claimed for the work on the strength of the position of the solstitial points given therein. "I feel bound to remark," says Prof. Max Müller, "that unless there was internal evidence that the Vedic hymns reached back to that remote antiquity this passage in the Jyotisha would by itself carry no weight whatever*." The existence of the different versions of the Vedânga Jyotisha and the obscurity into which some of its verses are still shrouded render it rather difficult to meet the above objection, especially as it is a side attack on the antiquity of the work with an admission that the position of the colure might have been recorded in the work from real traditions current in the time of its author. It is, however, needless to answer this objection, inasmuch as there is ample confirmatory evidence in the Vedic works themselves which not only bears out the statement in the Vedânga Jyotisha, but takes us back into still remoter antiquity.

There are many passages in the Taittiriya Sanhitâ, the Taittirîya Brâhmana and other works where the Krittikâs occupy the first place in the list of the Nakshatras.† In the Taittirîya Brâhmana (i. 1, 2, 1) it is distinctly stated

* See Pref. to Rig., Vol. IV., p. xxv. The mention of जौ for अश्वयुजे, first in the list of symbolic representations of the Nakshatras in verse 14, lends some support to these doubts.

† These together with the list, will be found in Pref. to Rig., Vol IV., p. xxxiv. Cf. Taitt. San. iv., 4. 10; Taitt Br. iii. 1. 1. 6 and i. 5. 1. 2.

" one should consecrate the (sacred) fire in the Krittikâs; ......the Krittikâs are the mouth of the Nakshatras."* This shows that the first place given to the Krittikâs in the list of the Nakshatras is not accidental and that we must at least suppose that the Krittikâs were the "mouth of the Nakshatras," in the same way as Vasanta or spring was the "mouth of the seasons"† or the Phâlgunî full moon the "mouth of the year."‡ The phrase is the same in all places and naturally enough it must be similarly interpreted. But granting that the Krittikâs were the mouth of the Nakshatras in the sense that their list always commenced with them, it may be asked what position we are to assign to the Krittikâs in the course of the year. There were, as I have previously shown, two beginnings of the year, the winter solstice and the vernal equinox; which of these two corresponded with the Krittikâs? Or, are they to be supposed to have coincided with a point altogether different from these two? A little consideration will show that it is not difficult to answer these questions satisfactorily. The present distance between the Krittikâs and the summer solstice is more then 30°, and if they ever coincided with the summer solstice it must have been long ago in the present cycle of the precession of the equinoxes. We cannot therefore interpret the above passage so as to place the summer solstice in the Krittikâs, unless we are prepared to take back the composition of the Taittirîya Sanhitâ to about 22,000 B. C., and further suppose that all evidence of the intermediate astronomical observations is entirely lost, and

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* कृतिकास्वग्निमादधीत ।......। मुखं वा एतन्नक्षत्राणां । यत्कृत्तिकाः ॥

† Taitt. Br. i. 1. 2. 6 मुखं वा एतदृतूनां यद्वसंतः ।

‡ Taitt. San. vii. 4. 8 quoted *infra.*

the same thing may be said against placing the Kṛittikâs in the autumnal equinox.* Both the suggestions in my opinion are too extravagant to deserve any consideration. Nor can we assign the beginning of the Nakshatras to any random point in the ecliptic. There thus remain two possible explanations : *viz.*, that the Kṛittikâs coincided either with the winter solstice, or with the vernal equinox. Now, considering the fact that the vernal equinox is placed in the last quarter of Bharaṇî in the Vedânga Jyotiṣha it is more natural to presume that the vernal equinox coincided with the Kṛittikâs at the time when the Taittirîya Sanhitâ was compiled. But we need not depend upon probabilities like these, when there are other passages in the Taittirîya Sanhitâ and Brâhmaṇa which serve to clearly define the position of the Kṛittikâs in those days.

In the Taittirîya Brâhmaṇa (i. 5, 2, 7) it is stated that "the Nakshatras are the houses of gods . . . . the Nakshatras of the Devas begin with the Kṛittikâs and end with Vishâkhâ, whereas the Nakshatras of Yama begin with the Anurâdhâs and end with the Apa-Bharaṇîs."† Prof. Max Müller appears to think that the latter group is called the Nakshatras of Yama because Yama presides over the last of them.‡ But the explanation appears to me to be quite unsatisfactory ; for on the same principle the first group should have been called the Nakshatras of Indrâgnî, the presiding deities of

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* A similar mistake is committed by the late Kṛishṇa Shâstri Godbole, in his essay on the antiquity of the Vedas, where he supposes Mṛigashiras to be in the autumnal equinox. p. 20, 21.

† देवगृहा वै नक्षत्राणि ।.....। कृत्तिका: प्रथमं। विशाखे उत्तमं। तानि देवनक्षत्राणि। अनूराधा: प्रथमं। अपभरणीरुत्तमं। तानि यमनक्षत्राणि। यानि देवनक्षत्राणि तानि दक्षिणेन परियंति। यानि यमनक्षत्राणि तान्युत्तरेण।

‡ Prep. to Rig. Vol. IV. p. xxxi.

Vishâkhâ, the last in that group. I am, therefore, disposed to think that the principle of division in this case is the same as that followed in the case of the Devayâna and the Piṭriyâna discussed before. We have the express authority of the Shatapatha Brâhmaṇa stating that the sun was to be considered as moving amongst and protecting the Devas, when he turned to the north, in the three seasons of spring, summer and rains. In other words the hemisphere to the north of the equator was supposed to be consecrated to the Devas and the southern one to the Pitṛis. Now, the sun moved amongst the Devas when he was in the northern hemisphere. The Devas, therefore, must have their abode in that hemisphere, and as the Nakshatras are said to be the houses of the Devas, all the Nakshatras in the northern hemisphere, from the vernal to the autumnal equinox, would naturally be called the Nakshatras of the Devas. Now the southern hemisphere was assigned to the Pitṛis ; but I have already quoted a passage from the Rigveda which states that it was the path of the god of death. In Rig. x. 14, 1, Yama is spoken of as the king of Pitṛis, and in verse 7 of the same hymn the deceased is told to go to the *pitṛi-loka*, where he would meet the god Yama. In the Vâjasaneyi Sanhitâ 19, 45, salutation is made to the world of Pitṛis in the kingdom of Yama. There are many other passages of similar import in the Sanhitâs,* and from all these it would be quite clear that the Pitṛiyâna or Pitṛi-loka was also called the kingdom of Yama. The Nakshatras in the southern hemisphere, therefore, came to be designated as the Nakshatras of Yama in opposition to the Nakshatras of the

* Cf. Taitt. San. vii. 3, 14. यमेन पितॄन् राज्ञा मनुष्यान् (*scil.*) अन्वभवत्। Also see Athar. Ved. xviii. 4.

Devas, thus dividing the whole circle of stars in two equal groups. This also explains why Yama is made to preside over the Apa-Bharaṇis. It was at the Apa-Bharaṇis that the zodiac was divided, the Kṛittikâs going over into the Devas' and the Apa-Bharaṇîs turning down into the Yama's portion of the celestial hemisphere.* The Taittirîya Brâhmaṇa further states that the Nakshatras of the Devas move towards the south while the Nakshatras of Yama move towards the north. The words *dakshiṇa* (south) and *uttara* (north) are in the instrumental case, and doubts have been entertained as to their exact meaning. But if we accept the statement in the Shatapatha Brâhmaṇa about the abode of the Devas, no other meaning is posible except that the Nakshatras of the Devas were counted from the vernal to the autumnal equinox, that is, to the point where the south (southern hemisphere) begins, and conversely in case of the Nakshatras of Yama. I may here mention that the movements of both the groups are described in the Brâhmaṇa in the present tense (*pari-yanti*), and that we may, therefore, suppose them to be recorded from actual observation. If this explanation of the division of the Nakshatras into the Nakshtras of gods and those of Yama is correct—and I think it is—it at once fixes the position of the Kṛittikâs at the beginning of the Devayâna or the vernal equinox at the time when these Vedic works were compiled.

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* May not Apa-Bharaṇîs have been so named from this circumstance? Bharaṇî appears to be an older name, changed afterwards into Apa-Bharaṇî, in the same manner, Mûla into Mûla-barhaṇî, and Jyeshṭnâ into Jyeshṭhaghnî. Perhaps the description of Apa-Bharaṇî in Taitt, Br i. 5, 1, may be so understood. It says :—

यमस्यापभरणीः । अपकर्षंतः परस्तात् । अपवहंतोऽवस्तात् ।

There is another and still more important passage in the Taittirîya Sanhitâ which supplies further confirmatory evidence on the same point. In the Taittirîya Sanhitâ vii. 4, 8, we have a discussion as to the time best suited for the commencement of the *Satras* like the *gavâm-ayana* which last for one whole year and as the passage is important in various ways I shall give it here in the original :—

संवत्सराय दीक्षिष्यमाणाएकाष्टकायां दीक्षेरन्नेषा वै संवत्सरस्य पत्नी यदेकाष्टकैतस्यां वाएषएताꣳ रात्रिं वसति साक्षादेव संवत्सरमारभ्य दीक्षंतआर्तं वाएते संवत्सरस्याभिदीक्षंते यएकाष्टकायां दीक्षंतेंतनामा-नावृतू भवतोव्यस्तं वाएते संवत्सरस्याभिदीक्षंते यएकाष्टकायां दीक्षं-तेंतनामानावृतू भवतः फल्गुनीपूर्णमासे दीक्षेरन्मुखं वाएतत् संवत्सरस्य यत्फल्गुनीपूर्णमासो मुखतएव संवत्सरमारभ्य दीक्षंते तस्यैकैव निर्या यत्साम्मेघ्ये विषूवान्त्संपद्यते चित्रापूर्णमासे दीक्षेरन्मुखं वाएतत्संवत्सरस्य यच्चित्रापूर्णमासो मुखतएव संवत्सरमारभ्य दीक्षंते तस्य न काचन निर्या भवति चतुरहे पुरस्तात्पौर्णमास्यै दीक्षेरन्तेषामेकाष्टकायां क्रयः संपद्यते तेनैकाष्टकां न छंबट्कुर्वंति तेषां पूर्वपक्षे सुत्या संपद्यते पूर्व-पक्षं मासाअभिसंपद्यंते ते पूर्वपक्ष उत्तिष्ठंति तानुत्तिष्ठतओषधयो वनस्पत-योनूत्तिष्ठंति तान्कल्याणी कीर्तिरनूत्तिष्ठत्यरात्सुरिमे यजमानाइति तदनुसर्वे राध्नुवति ।

In the Tândya Brâhmaṇa (v. 9) we have the same passage with a few additions and alterations, and as this has been quoted by the commentators I shall give it here for comparison :—

एकाष्टकायां दीक्षेरन् ॥ १ ॥

एषा वै संवत्सरस्य पत्नी यदेकाष्टकैतस्यां वाएताꣳ रात्रिं वसति साक्षादेव तत्संवत्सरमारभ्य दीक्षंते ॥ २ ॥

तस्य सा निर्या यदपोऽनभिनंदंतोऽभ्यवयंति ॥ ३ ॥

विच्छिन्नं वाएते संवत्सरस्याभिदीक्षंते यएकाष्टकायां दीक्षंतेऽतनामाना-
वृतू भवतः ॥ ४ ॥

आर्तं वाएते संवत्सरस्याभिदीक्षंते येंऽतनामानावृतू अभिदीक्षंते ॥ ५ ॥

तस्मादेकाष्टकायां न दीक्ष्यम् ॥ ६ ॥

फाल्गुने दीक्षेरन् ॥ ७ ॥

मुखं वाएतत्संवत्सरस्य यत्फाल्गुनो मुखतएव तत् संवत्सरमारभ्य
दीक्षंते ॥ ८ ॥

तस्य सा निर्या यत्सम्मेघे विषुवान् संपद्यते ॥ ९ ॥

चित्रापूर्णमासे दीक्षेरन् ॥ १० ॥

चक्षुर्वाएतत् संवत्सरस्य यच्चित्रापूर्णमासो मुखतो वै चक्षुर्मुखतएव
तत् संवत्सरमारभ्य दीक्षंते तस्य न निर्यास्ति ॥ ११ ॥

चतुरहे पुरस्तात् पौर्णमास्या दीक्षेरन् ॥ १२ ॥

तेषामेकाष्टकायां क्रयः संपद्यते तेनैकाष्टकां न संवट् कुर्वंति ॥ १३ ॥

तेषां पूर्वपक्षे सुत्या संपद्यते पूर्वपक्षे मासाः संतिष्ठमाना यंति
पूर्वपक्षेउत्तिष्ठंति तानुत्तिष्ठतः पशवः ओषधयोऽनूत्तिष्ठंति
तान्कल्याणी वागभिवदत्स्यरात्सुरिमे सत्रिणइति राध्नुवंति ॥ १४ ॥

The third *sûtra* in the above gives an additional reason for rejecting the Ekâṣhṭakâ ; while in the fourth *sûtra vichhinnam* is substituted for *vyastam* of the Taittiriya Sanhitâ. Another important change is, that the word *Phalgunî-pûrnamâsa* is paraphrased by *Phâlgunî* in the 8th *sûtra*, thus clearly showing that the former was then understood to mean the full-moon night. Both the passages are similar in other respects.

Fortunately for us Sâyaṇâchârya is not our only guide in the interpretation of these important passages. It is probably the only passage (the two passages being similar I treat them as one) in the Vedas where the commencement of the annual *satra* is given and from the ritualistic point of view it has formed the subject of a learned discussion amongst the Mîmânsakas. Jaimini in his Mîmânsa-darshana Chap. vi. Sect. 5 has devoted an Adhikarana (10th) to the interpretation of this passage, and the subject has been thoroughly discussed by Shabara, Kumârila, Pârthasârathi, Khaṇḍadeva and other writers on Mîmânsâ. We have thus a continuous tradition about the meaning of this passage current amongst the Indian divines—a tradition based not upon mere authority, but on the logically solid rules of exegetics propounded in the work of Jaimini. I shall first give a literal translation of the passage from the Taittirîya-Sanhitâ and then discuss its interpretation as bearing on the present question.

"Those who are about to consecrate themselves for the year (sacrifice) should do so on the Ekâṣhṭakâ (day). The Ekâṣhṭakâ is the wife of the year; and he [*i. e.*, the year] lives in her [*i. e.*, the Ekâṣhṭaka] for that night. (Therefore they) practically sacrifice (by) beginning the year.* Those that sacrifice on the Ekâṣhṭakâ, sacrifice to the distressed (period) of the year. It is the season (*dual*) whose name comes last. Those, that sacrifice on the Ekaṣhṭakâ, sacrifice

* The Tâṇḍya Brâhmaṇa, (*Sûtra* 3 in the above passage) adds a third reason thus:—" They go to *avabhritha* [*i. e.*, the final bath] not delighted with water." Shabara and other commentators on Jaimini have noticed this additional ground for rejecting the Ekâshṭakâ.

to the reversed* (period) of the year. It is the season (*dual*) whose name comes last. They should consecrate themselves for the sacrifice on the Phalgunî full moon. The Phalgunî full-moon is the mouth of the year. They sacrifice (by) beginning the year from the very mouth. It has only one fault, *viz.*, that the Vishûvân [*i.e.*, the equator or the central day] falls in the rains. They should consecrate themselves for the sacrifice on the Chitrâ full-moon. The Chitrâ full-moon is the mouth of the year. They sacrifice (by) beginning the year from the very mouth. It has no fault whatsoever. They should consecrate themselves for the sacrifice four days before the full-moon. Their *Kraya* [*i.e.*, the purchase of soma] falls on the Ekâshṭakâ. Thereby they do not render the Ekâshṭakâ void [*i.e.*, of no consequence]. Their *Sutya* [*i.e.*, the extraction of soma juice] falls in the first [*i.e.*, the bright] half (of the month). Their months [*i.e.*, the monthly sacrifices] fall in the first half. They rise [*i.e.*, finish their sacrifice] in the first half. On their rising, herbs and plants rise after them. After them rises the good fame that these sacrifices have prospered. Thereon all prosper."

Here in the beginning we are told that the Ekâshṭakâ is the day to commence the *Satra*, which lasts for one year. But the word Ekâshṭakâ is used to denote the eighth day of the latter (dark) half of the four months of Hemanta and Shishira seasons,† and sometimes it means the eighth day of the

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* According to the Tândya Brâhmaṇa "broken" or "destroyed."

† Cf. Ashv. Gri. Sutra ii. 4, 1; हेमंतशिशिरयोश्चतुर्णामपरपक्षाणामष्टमीष्वष्टकाः।

dark half of each of the twelve months of the year.* The statement in the following sentences that this Ekâshṭakâ is liable to the objection of occurring in the cold or the last season does, however, at once narrow the field of our choice. It must be further borne in mind that the Ekâshṭakâ, here spoken of, is the wife of the year, and is contrasted with the Phalgunî and Chitrâ full-moons ; while tradition in the time of Jaimini and Âpastamba interpreted it to mean the 8th day of the dark half of Mâgha. All writers on Mîmânsâ therefore take this Ekâshṭakâ to mean the 8th day of the dark half of Mâgha. As the Ekâshṭakâ is the wife of the year† and as the god of the year is said to reside with her on that night, those that commence their sacrifice on that Ekâshṭakâ may practically be supposed to commence it at the beginning of the year which resides there. In other words the Ekâshṭakâ is thus a constructive beginning of the year, and therefore the yearly sacrifice may be commenced on that day. But the passage now proceeds to point out the objections to the commencing of the sacrifice on the Ekâshṭakâ day. The 8th day of Mâgha falls during the distressed period of the year, that is, according to Shabara and other commentators the period

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* Cf. Tândya Brâhmana x. 3, 11. द्वादशैकाष्टकाः द्वादशामावास्याः। Sâyaṇa in his commentary on Tan. Br. v. 9, observes that Ekâshṭakâ is there used in its secondary sense and quotes Apastamba Grihya Sutra (viii. 21, 10) thus:— या माध्या पौर्णमास्या उपरिष्टाद्व्यष्टका तस्याष्टमी ज्येष्ठय संपद्यते। तामेकष्टकेत्याचक्षते। Thus both Jaimini and Apastamba considered Ekâshṭakâ to mean the 8th day of the dark half of Mâgha.

†Shabar on Jaimini vi. 5, 35, quotes Atharva Veda iii. 10, 12 ; and Sâyaṇa in his Comm. on Taitt. San. vii. 4, 8, cites, Atharva Veda iii. 10, 12, and Taitt. San. iv. 3, 11, 3. But these texts simply state that the Ekâshṭakâ is the wife of the year, without defining the Ekâshṭakâ.

when people are distressed by cold.* The word in the text is *ârta* which literally means 'distressed,' but Sâyaṇa takes it to denote the end or destruction of the year, implying thereby that the old year is then brought to an end and that the consecration for the yearly *satra*, which must be made before the beginning of the new year, or, in other words, not after the previous year is ended or destroyed, cannot be made at this time. Though Shabara and Sâyaṇa thus give different interpretations of *ârta*, practically both agree in holding that in those days the old year ended before the eighth day of the dark half of Mâgha; for Shabara distinctly states that the word "reversed" used further on means "reversed on account of the change of *ayana*."† Sacrificing during the distressed period of the year is thus the first objection to commencing the *satra* on the Ekâshṭakâ day. The second objection is that it is the last season, that is, though you *may* be said to sacrifice to the constructive *beginning* of the year, yet as far as the seasons are concerned you sacrifice in the *last* of them. The word for season, *ṛitu*, has been used in the text in the dual number and it might be urged that it denotes two seasons. A reference to the Taittirîya Sanhitâ iv. 4-11, 1. will, however, show that the word *ṛitu* is there used in dual, probably because each season comprises two months,‡ just as "scissors" is used in plural in English.

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* आर्ता यस्मिन्काले भवंति स आर्तः कालः, शीतेन च आर्ता भवंति। Shabara on Jaim. vi 5. 37. Sâyaṇa आर्तमभिविनाशमभिलक्ष्य दीक्षंते।

† अयनपरिवृत्तिर्व्यस्तशब्देनोच्यते। Shabara on Jaimini vi 5. 37. Sâyana in his comm. on Taitt. San. says व्यस्तमभिविपर्यासमभिलक्ष्य दीक्षंते। आदौ हि दीक्षा कर्तव्या। अयं संवत्सरस्यांतः कालः।

‡ मधुश्च माधवश्च वासंतिकावृतू। Upon this passage the author of Kâla-Mâdhava observes द्विवचनं ऋत्ववयवमासाभिप्रायम्। Cal. Ed., p.59

A similar passage also occurs in the Vâjasaneyi Sanhitâ (13-25) and Mahîdhara while commenting on it expressly states that the dual there has the meaning of the singular number.* The "last named seasons (*dual*)" therefore simply means "the last season." It must be here mentioned that according to the passage in the Tâṇḍya Brâhmaṇa, which Shabara appears to quote, the first objection is thus stated :—"not delighted with water they go to *avabhṛitha* [*i. e.*, the final bath]." This is but an amplification of the objection on the ground of the "last season" and Khaṇḍadeva expressly says that water is then undelightful "on account of cold." The Taṇḍya Brâhmaṇa does not omit the objection of the "last season ;" but simply expands and illustrates the same by referring to the natural dislike for a cold bath in that season. We may, therefore, regard this objection more as explaining the first than as an additional one. We now come to the third objection, *viz.*, those that commence the sacrifice on the Ekâshṭakâ day sacrifice to the reversed period of the year. 'Reversed', *vyasta* in the original, is said by Shabara to indicate the change of *ayana* caused by the turning away of the sun from the winter solstice,† and Sâyaṇa seems to understand it in the same way. Thus although those that commence the *satra* on the 8th day of the dark half of Mâgha may be supposed to do so practically at the beginning of the year, the husband of the Ekâshṭakâ, yet the procedure is triply objectionable, inasmuch as they sacrifice in the *cold* season, in the *last* of seasons (when water is undelightful) and when the year is *reversed* or *upset* by the turning away of the sun from the winter solstice.

* द्विवचनमेकवचनार्थम् ।

† See Shabara quoted in the second note on the last page.

To get over this threefold objection an alternative is next proposed. The Phalguni full-moon day was known to be the first day of the year. If you commence your sacrifice on that day, you avoid the three objections previously noted and still secure your object of sacrificing at the beginning or the mouth of the year. But even this course is not faultless ; because if you commence on the Phalgunî full-moon the middle or the central day of the *satra* falls in the rainy season, which again is not a desirable time. The first twelve days of a *satra* are taken up in the consecration and twelve more in *upasads* after which the regular *satra* sacrifices commence. So the middle day of the *satra* falls after six months and twenty-four days from the Phalguni full-moon, that is, on the ninth of the bright half of the month of Âshvina.* Now if we suppose the winter solstice or the beginning of the cold season to fall on the Mâgha full-moon, the summer solstice, or the end of the summer and the beginning of the rainy season, would fall a little after the full-moon in Shrâvaṇa. The months of Bhâdrapada and Âshvina therefore represented the rainy season in those days, and the occurrence of the Vishûvân in Âshvina or the rainy season was not believed to be auspicious. As the next alternative it is, therefore, suggested that the consecration should take place on the Chitrâ full-moon, and this course is said to be open to no objection whatsoever.

But even this is given up for a still better time, and it is finally stated that persons desirous of consecrating themselves for the *satra* should do so " four days *before the full moon*." The full-moon here mentioned is not, however,

* This, in substance, is Sâyaṇa's explanation in his commentary on this passage.

specifically defined, and consequently it forms the subject of one of the Jaimini's Adhikaraṇas.* As no specific full-moon is mentioned it may mean either *any* full-moon-day, or the Chitrâ full-moon which is mentioned next before in the same passage, or it may refer to the Mâgha full-moon as the Ekâṣhṭakâ is mentioned immediately afterwards in connection with it. Jaimini decides that it is the full-moon in the month of Mâgha, for it is stated immediately after, that those who commence the sacrifice on this full-moon will purchase their Soma on the Ekâṣhṭakâ. This Ekâṣhṭakâ can evidently be no other than the one mentioned in the beginning of the passage, and the object of the arrangement last suggested is to utilise somehow or other the important day of the Ekâṣhṭakâ, which was at first recommended for the commencement of the sacrifice itself, but which had to be given up on account of the three-fold objection stated above. The full-moon must, therefore, be the one next preceding this Ekâṣhṭakâ. Again the full-moon day is said to be such that when the sacrifice is finished the herbs and the plants spring up, which, as remarked by Shabara, can happen only in the Vasanta season.

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* Jaimini vi. 5, 30-37. Jaimini's Sûtras which I have here tried to translate and explain are as follows:—1. पौर्णमास्यामनियमोऽविशेषात्; 2. आनंतर्यात्तु चैत्री स्यात्; 3. माघी वैकाष्टकाश्रुतेः; 4. अन्याऽपीति चेत्; 5 न भक्तित्वादेषा हि लोके; 6. दीक्षापराधे चानुग्रहात्; 7. उत्थाने चानुप्ररोहात्; 8. अस्यां च सर्वलिंगानि. Sâyaṇa in his Jaimini nyâya-mâla vistâra and in his comm. on the Taitt. Sam. fully adopts this view. But in his comm. on the Tâṇḍya Brâhmaṇa, v. 9. 12 (Cal. Ed.) he is represented as saying that the full moon last mentioned refers to the Chaitrî! Some one, either the scribe the printer, or the publisher, has here obviously committed an error.

To sum up ; the last mentioned full-moon, though not specifically defined, must be prior to the Vasanta season and also the next previous to the Ekâṣhṭakâ, which is the wife of the year and which falls in the cold season, in the last season, *i e.*, Shishira [or when water is not delightful] and after the sun has passed through the winter solstice. It must also be remembered that the Phalguni and the Chitrâ full-moon are to be excluded. Jaimini, therefore, concludes that this full-moon cannot be any other than the one falling in the month of Mâgha, and his conclusion has been adopted by all the Mîmânsakas. We can now understand why Laugâkṣhi, quoted by Somâkara, states that "they sacrifice to the year four days before the full-moon in Mâgha."*

If Jaimini's interpretation of this passage is correct, we may, so far as our present inquiry is concerned, deduce the following conclusions from it :—(1) That in the days of the Taittiriya Sanhita the winter solstice occurred before the eighth day of the dark half of Mâgha, which again was a month of the cold season. Whether the solstitial day fell on the Mâgha full-moon is not so certain, though it may be taken as fairly implied. For the Ekâṣhṭakâ was abandoned because it occurred in the "reversed" period of the year, and it is quite natural to suppose that the priests in choosing a second day would try to remove as many of the objections to the Ekâṣhṭakâ as they could. In other words, they would not select a day in the "reversed" period of the year, nor one in the last season. The fact that a day before the full-moon in Mâgha was selected is, therefore, a clear indication of the solstice occurring on that day, while their anxiety

* माघ्याः पौर्णमास्याश्चतुरहः पुरस्तात्संवत्सराय दीक्षंते ।

to utilise the Ekâshṭaka fully accounts for the selection of the fourth in preference to any other day before the full-moon. I may also remark that throughout the whole passage the intention of sacrificing at the beginning (real, constructive, or traditional) of the year is quite clear. The full-moon-in Mâgha must, therefore, have been one of such beginnings. (2) That the year then commenced with the winter solstice. (3) That as there cannot be three real beginnings of the year at an interval of one month each, the passage must be understood as recording a tradition about the Chitrâ full moon and the Phalgunî full-moon being once considered as the first days of the year. (4) That *Vishuvân* had lost its primary meaning and that it fell in the rainy season if the sacrifice was commenced on the Phalgunî full-moon.

The passage thus supplies not only confirmatory, but direct evidence of the coincidence of the Kṛittikâs with the vernal equinox in the days of the Taittirîya Sanhitâ. For, if the winter solstice fell on the full-moon day in Mâgha, then the summer solstice, where the moon must then be, must coincide with the asterism of Maghâ, and counting seven Nakshatras backwards we get the vernal equinox in the Kṛittikâs. Independently of the Vedânga Jyotisha we thus have four different statements in the Taittirîya Sanhitâ and Brâhmaṇa clearly showing that the vernal equinox was then in the Krittikâs: *firstly*, the lists of the Nakshatras and their presiding deities, given in the Taittirîya Sanhitâ and Brâhmaṇa, all beginning with the Kṛittikâs; *secondly*, an express statement in the Taittirîya Brâhmaṇa, that the Kṛittikâs are the mouth of the Nakshatras; *thirdly*, a statement that the Kṛittikâs are the first of the Deva Nak-

shatras, that is, as I have shown before, the Nakshatras in the northern hemisphere above the vernal equinox ; and *fourthly*, the passage in the Taittirîya Sanhitâ above discussed, which expressly states that the winter solstice fell in the month of Mâgha. The vernal equinox is referred to the Kṛittikâs directly or indirectly in all these passages and I do not think that any more confirmatory evidence from the Vedic works is required to establish the proposition that the Kṛittikâs coincided with the vernal equinox, when the Taittiriya Sanhitâ was compiled. As an additional proof I may, however, mention the fact, that Pitṛis are said to be the presiding deities of Mâgha in the Taittiriya Sanhitâ iv. 4. 10. 1. With the Kṛittikâs in the vernal equinox Mâgha is the summer solstice and as the Dakṣhiṇâyana or the *ayana* of the Pitṛis commenced at this point, the asterism which happened to be there at that time was naturally assigned to the Pitṛis. The position for all the other cardinal points of the ecliptic can be thus shown to be consistent with the position of the vernal equinox in the Kṛittikâs.

Supposing the Kṛittikas to denote the asterism of that name this gives us, according to Prof. Whitney's* calculation, 2350 B. C. as the probable time for the compilation of the Taittirîya Sanhitâ. Some scholars unwilling to carry the antiquity of the work to such a remote period, have urged, without assigning any special reason, that by Kṛittikâs we must here understand the beginning of the zodiacal portion of that name. Now as the position of the asterism of the Kṛittikâs in its zodiacal portion is 10° 50′ from the beginning,† these scholars would place the vernal equinox

* See Sûrya Siddhânta, Add. notes, p. 323.

† This is the position given in the Sûrya Siddhânta viii. 29. See the table prepared by Prof. Whitney in his notes to this passage

about 11° behind the asterism of the Krittikas and thus reduce the antiquity of the Sanhitâ nearly by $11 \times 72 = 792$ years or to about 1426 B. C.* I have briefly stated before my reasons for discarding this supposition and holding that the names of the Nakshatras in the early Vedic days must be taken to denote the asterisms known by such names. If Indian priests are to be supposed incapable of making any accurate observations of solstitial points in 1200 B. C., † it is to my mind utterly inconsistent and illogical to hold that the forefathers of these priests, when they assigned the vernal equinox to the Krittikâs, understood the word to mean not the asterism but the imaginary beginning of the zodiacal portion of that name. I cannot also understand why scholars should hesitate to assign the Vedic works to the same period of antiquity which they allow to the Chinese and the Egyptians. ‡ But it is needless here to enter into this controversy. For if I once succeed in showing, as I hope to do, that there is sufficient internal evidence in the Vedic literature itself of a still remoter antiquity, all theories, conjectures, and guesses, which have the effect of unduly reducing the antiquity of the Vedic works and also of throwing discredit upon the claims of the Indians to the origin of the Nakshatra system, will require no refutation.

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* This is Bentley's date about which see *infra*.

† See Pref. to Rig., vol IV., p. xxix.

‡ M. Biot allows it in the case of the Chinese and considers that the Hindus borrowed the Nakshatra system from them. Albîrunî, in his chronology of ancient nations, &c., observes that other nations begin their asterisms with the Pleiades. He further states that he has found in some books of Hermes that the vernal equinox coincides with the rising of the Pleiades, but, says he "God knows best what they intend !"

Bentley, however, takes his stand on a different ground. He suggests that the word *Vishâkhâ*, like *Vidala*,* may mean "possessed of two branches," and that these two branches may have been caused by the equinoctial colure bisecting the zodiacal portion of the Vishâkhâs. Now the equinoctial colure passing through the beginning of the divisional Kṛittikâs naturally bisects the zodiacal portion of Vishâkhâ. Bentley, therefore, concludes, without any more proof than this etymological conjecture, that this was the position of the colure when Vishâkhâ received its name. This is no doubt an ingenious hypothesis. But there is not only no evidence in the Vedic works to support such etymological speculation, but it may be easily shown to be inconsistent with the position of the winter solstice in the day of the Taittirîya Sanhitâ.

I have already stated that from the passage of the Taittirîya Sanhitâ just quoted we may fairly infer that the winter solstice occurred in those days on the full moon in Mâgha. According to the Vedánga Jyotiṣha it fell a fortnight earlier, that is, on the first day of the bright half of Mâgha. It is roughly estimated that the equinox must recede about two divisional Nakshatras, *i.e.*, 26° 40′, to make the seasons fall back by one month. Between the times of the Taittirîya Sanhitâ and the Vedânga Jyotiṣha the equinox must accordingly recede 13° 20′ or nearly 14°. Now the position of the equinox as given in the Vedânga Jyotiṣha is 10° of Bharaṇî. From this to the beginning of the *divisional* Kṛittikâs, the distance is only 3° 20′, while if we measure it from the *asterism* of Kṛittikâ it is 3° 20′+10°

* This example has been added by Prof. Max Müller. See Pref. to Rig., Vol. IV., p. xxx. See also Bentley's Historical view of Hindu Astronomy, p. 2.

50′ = 14° 10′. Therefore during the period that lapsed between the Taittirîya Sanhitâ and the Vedânga Jyotisha the equinox, according to Bentley, receded only 3° 20′; while if we understand the Krittikâs to denote the asterism of that name, it gives us a precession of 14° 10′. Now as the winter solstice fell a fortnight later in the days of the Sanhitâ we must accept the latter precession of 10°, which alone corresponds with that interval of time (*i. e.* a fortnight) and assume that the vernal equinox then coincided with the asterism of Krittikâ, a conclusion the probability of which has already been established on other grounds. Bentley's speculation must, therefore, be rejected, unless we are prepared to allow his guess about the primary meaning of Vishâkhâ to prevail against reasonable conclusions based upon a passage from the Taittirîya Sanhitâ.

But even admitting Bentley's speculation about the meaning of Vishâkhâ, we may fairly question the soundness of the conclusion drawn therefrom. For what ground is there for holding that the two divisions of Vishâkhâ must be mathematically *equal* in every respect? The word *dala* in *vidala* may be so understood; but *dala* and *shâkhâ* are not similar in this respect. Bentley's error, therefore, consists not in supposing that the colure may have cut the divisional Vishâkâs, but in inferring therefrom that it must have bisected it. The whole ecliptic was divided into 27 Nakshatras, and 13½ could only be comprised in each hemisphere. Vishâkhâ, the 14th Nakshatra from the Krittikâs, may have been thus considered, by simply counting the number of the Nakshatras, as lying partly in the region of the Devas and partly in that of the Pitris.*

* This is enough to satisfy a merely etymological speculation unsupported by any other evidence whatsoever. Speaking more

For though we might hold that the Vedic observers were not provided with means to fix imaginary points in the heavens and to refer to these points the motions of the heavenly bodies as astronomers do at present, yet it does not imply that they were unaware of the approximate distances between the various asterisms selected by them. In other words, they might be supposed to have roughly known the distances between the stars, though for obvious reasons they could not but refer the motions of the heavenly bodies only to the fixed stars. Thus understood, Bentley's conjecture about the primary meaning of Vishâkhâ does not necessarily imply that the equinoctial colure bisected the divisional Vishâkhâs in those days; and when the conjecture itself does not thus support his theory about the position of the colure, I do not think we shall be justified in accepting it, especially when it is shown that it is also objectionable on other grounds. I am, therefore, disposed to fix the date of the Taittirîya Sanhitâ at 2350 B. C., and not 1426 B. C. as Bentley has done.

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accurately if the vernal equinox coincided with the asterism of the Krittikâs, the equinoctial colure falls out of the divisional Vishâkas by 4°, but it is nearly 6° behind the asterism of Anurâdhâ. Of these two asterisms Vishâkhâ would therefore be nearer to the colure. But we might as well ask what ground there is for holding that the Nakshatra *divisions* of the Zodiac, at the time when the vernal equinox was in the Krittikâs (supposing such divisions to have then existed), were the same as those which we now use and which commence with Revati. Bentley appears to have altogether overlooked this objection. I have already stated my view regarding the existence of the divisional Nakshatras in old times, and I would reject Bentley's etymological speculation on the mere ground that it requires us to assume the existence of such divisional Nakshatras and their bisection by colures.

So far, we have been going over the ground more or less traversed before by several scholars. But it may be asked if we have here reached the *Ultima Thule* of the Vedic antiquity. Does the oldest hymn, the first utterance of the Aryan mind, reach back thus far and no further? Was it such a hymn that the Brahma-vâdins of old and Pâṇini several centuries before Christ believed and declared as "seen"? In what follows, I propose to bring together such evidence from the Vedic works as would enable us to deal with these questions. I have already drawn attention to the fact that the Chitrâ and the Phalgunî full-moon are mentioned as the mouths or the beginnings of the year in the passage from the Taittirîya Sanhitâ last quoted and discussed. In the next chapter I shall endeavour to show how these statements are to be interpreted, how far they are corroborated by other evidence and what conclusions we may deduce therefrom.

CHAPTER IV.

AGRAHÂYAṆA.

Phâlgunî full-moon, the new year's night—Sâyana's explanation unsatisfactory—Phâlguna could not be a Vasanta month—Two fold character of the seasons, lunar and solar, superfluous—Discussion of a passage in Shushruta—Bhâskara Bhatta's explanation.—Winter solstice on the full-moon in Phâlguna—The position of other cardinal points Vernal quinox in Mrigashiras—*Agrahâyaṇî*-Native Lexicographers' explanation of the word—Grammatically objectionable— its real meaning according to Pâṇini—Erroneous rank of Mârgashîrsha amongst months according to the Bhagavad Gîtâ and Amara—Mârgashîrsha could not have been the first month of the solistitial or the equinoctial year—It leads to the libration of the equinoxes—Possible reason of the libration theory—Mrigashiras—*Agrahâyaṇa* or the first Nakshatra in the year—Mûla, its primary meaning—Evidence of the summer solstice ôccuring in Bhâdrapada—Origin of the annual feasts to the manes amongst Hindus and Parsis—Comparison of the primitive Hindu and Parsi calender—Summary of results.

The passage from the Taittirîya Sanhitâ quoted in the last chapter states that the Chitrâ and Phalgunî full-moons were the beginnings of the year, which then commenced with the winter solstice in the month of Mâgha. The words used in the original are *Chitrâ-purṇa-mâsa* and *Phalgunî pûrṇa-mâsa* and these must be understood to denote, not the Chaitra and the Phâlguna months, whether sidereal and synodical, as Prof. Weber seems to have, in one case, supposed, but the full-moon *days* in each of these months. This is evident from the fact that these have been recommended as alternative times for the commencement of the *satra* in opposition to the Ekâṣhṭakâ day. In the case of the *Phalgunî-pûrṇa-mâsa* we are further told that Vishûvân

counted from that time falls during the rainy season, and it is impossible to suppose that Vishûvân can be counted from a month. The whole context, therefore, shows that it is a discussion as to the particular *day* best suited to commence the yearly sacrifice, and that *Chitrâ-pûrṇa-mâsa* and *Phalgunī-pûrṇa mâsa* must mean the days when the moon is full near the asterisms of Chitrâ and Phalgunî. In the Tâṇḍya Brâhmaṇa* *Phalgunî-pûrṇa-mâsa* is rendered by *Phâlgunî* and Jaimini has paraphrased *Chritâ-pûrṇa-mâsa* by *Chaitrî* and *Phalgunî* and *Chaitrî*, according to Pâṇini (iv. 2. 3), are the names of days. These interpretations have been accepted by all the Mîmânsakas including Sâyaṇa, and we may do the same especially as there are several passages in the Taittirîya Sanhitâ where *pûrṇa-mâsa* is used in a similar sense.†

But why should the Chitrâ and the Phalgunî full-moon be called the beginnings of the year? Sâyaṇa thinks that they were so described because they occurred during Vasanta or the first of the seasons.‡ But the explanation does not appear satisfactory. I have previously shown that according to all astronomical works Shishira commenced with the winter solstice, and that the three seasons of Shi-

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* See the passages quoted in the last chapter.

† In Taitt. San. ii 2. 10. 1. we find तिष्यापूर्णमासं similarly used. In i. 5. 10. 3. दर्शपूर्णमासौ are mentioned together; while in ii. 5. 4. 1. पूर्णमास and अमावास्या are contrasted.

‡ In his commentary on Taitt. San. vii. 4. 8. speaking of फल्गुनीपूर्णमास Sâyaṇa observes तस्य च भविसंवत्सरोपक्रमदिनत्वात्। एतदेवाभिप्रेत्याधानब्राह्मणे समाम्नातं। उत्तरयोरादधीत। एषा वै प्रथमा रात्रिः संवत्सरस्य यदुत्तरे फल्गुनी इति।; while of चित्रापूर्णमास he says:- सोऽपि वसंतर्तुमध्यपातित्वात्संवत्सरस्य मुखमेव।

shira, Vasanta and Grişhma were comprised in the Uttarâyaṇa as it was then understood. Now in the days of the Taittiriya Sanhitâ the winter solstice, as shown in the last chapter, fell in the month of Mâgha; and Mâgha and Phâlguna were therefore comprised in Shishira, and Chaitra and Vaishâkha in Vasanta. But in order that Sâyaṇa's explanation might be correct Phâlguna must fall in the Vasanta season which, as a matter of fact, it did not. In his commentary on the Baudhâyana Sûtras* and also in the Kâlamâdhava† Sayaṇa tries to get over this difficulty by proposing a double Vasanta—lunar and solar, the lunar to include the months of Phâlguna and Chaitra, and the solar those of Chaitra and Vaishâkha, quoting amongst others, Rig. x., 85, 18, as an authority to show that the seasons were regulated by the moon. The authorities, however, are not explicit and therefore sufficient to maintain the two-fold character of the seasons; nor do I see the necessity of the two-fold character. It is true that the months in the calendar were all lunar, but the concurrence of the lunar and the solar year was always secured by inserting an intercalary month whenever necessary. Under such a system lunar seasons can have no permanent place. Now and then lunar months ceased, as they now do, to correspond with the

* The passage is quoted in India: what it can teach us? p. 323; Sâyana there quotes Taitt. San. vii. 4. 8., and after noticing that the Chitrâ and the Phalgunî full moon are both said to begin the year, he observes:—अथवा फाल्गुनश्चैत्रो वसंतः मुखं वा एतत्संवत्सरस्य यत्फाल्गुनीपूर्णमास इति श्रुतेः। एवं च सौरचांद्रभेदभिन्नं वसंतद्वयमुपसंगृहीतं भवति। The theory of the two-fold seasons thus appears to have been started simply to reconcile the two statements about the Chitrá and Phalgunî full moons.

† See Cal. Ed., pp. 60, 61.

seasons they represented, but this was at once set aright by the introduction of an intercalary month. If we, therefore, exclude the correction due to the precession of the equinoxes, which was too minute to be noticed till after hundreds of years, there was thus no reason why the lunar seasons should come to be regarded as a permanent institution. But even accepting Sâyaṇa's two-fold character of the seasons, it can be easily shewn that it does not support his conclusions. A lunar year is shorter than a solar year by 11 days. If the solar Vasanta, therefore, commences on the 1st day of the lunar Chaitra month this year, it will commence on the 12th day of Chaitra (lunar) next year and 11 days later still in the third year when by the introduction of an intercalary month the commencement of Vasanta will be again brought back to the 1st day of Chaitra. The two-fold character of the seasons may thus delay the beginning of Vasanta to Vaishâkha (lunar), but the season cannot be accelerated and brought back to Phâlguna. It is true that in the day of Sâyaṇa (14th century) Vasanta commenced, as it does now, in the month of Phâlguna ; but it was so because the winter solstice had receded by over full one month by that time. Sâyaṇa does not appear to have fully realised the reason of this change and combining the occurrence of Vasanta in Phâlguna in his time with the occurrence of the same season in Chaitra in the days of the Taittiriyâ Sanhitâ and other works he attempted to reconcile the difference on the theory of the two-fold character of the seasons. But we can now better understand the change as due to the precession of the equinoxes, and must, in consequence, reject Sâyaṇa's explanation as unsatisfactory.

The only other authority I can find for supposing that Phâlguna was a Vasanta month is the statement in Shu-

shruta's medical work, that "Phâlguna and Chaitra make Vasanta." But on a closer examination of the passage wherein this sentence occurs, it will be found to bear on its face the marks of later insertion. There are two consecutive paragraphs in Shushruta, each enumerating and describing the seasons of the year. The first states that "There the twelve months, beginning with Mâgha, make six seasons, comprising two months each. They are Shishira, &c.........Of these Tapa and Tapasya make Shishira" and so on until all the six seasons in their usual order, the *ayanas*, the year and the lustrum are described; and at the end we have "this is called the wheel of time by some."* The second paragraph then begins with the words "*But here*" and continues to state "But here the six seasons are,—Varṣhâ, Sharad, Hemanta, Vasanta, Grîṣhma and Prâvṛiṣh," thus altogether dropping Shishira and dividing the rainy period into two seasons Varṣhâ and Prâvṛiṣh. The paragraph then proceeds to assign the months to the seasons as follows :—"Bhâdrapada and Âshvina is Varshâ, Kârtika and Mârgashîrṣha is Sharad, Pauṣha and Mâgha is Hemanta, and Phâlguna and Chaitra is Vasanta;" and so on until

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* See Shushruta, Sûtrasthâna Adhyâya 6. The two consecutive paragraphs here referred to are :—

तत्र माघादयो द्वादश मासा द्विमासिकमृतुं कृत्वा षड्ऋतवो भवंति। ते शिशिरवसंतग्रीष्मवर्षाशरद्धेमंताः। तेषां तपस्तपस्यौ शिशिरः। . . . . . अयने द्वे भवतः। दक्षिणमुत्तरं च। तयोर्दक्षिणं वर्षाशरद्धेमंताः. . . .। स एष निमेषादियुगपर्यंतः कालश्चक्रवत्परिवर्तमानः कालचक्रमुच्यत इत्येके।

इह तु वर्षाशरद्धेमंतवसंतग्रीष्मप्रावृषः षड्ऋतवो भवंति।...। ते तु भाद्रपदाद्येन द्विमासिकेन व्याख्याताः। तद्यथा। भाद्रपदाश्वयुजौ वर्षाः। कार्तिकमार्गशीर्षौ शरत्। पौषमाघौ हेमंतः। फाल्गुनश्चैत्रो वसंतः। वैशाखज्येष्ठौ ग्रीष्मः। आषाढश्रावणौ प्रावृडिति।

all the months are assigned to their respective seasons. The second paragraph, however, makes no mention of the *ayanas*, the year, or the lustrum. It is therefore evident that the writer of the second paragraph, whosoever he may be, wished to note that the seasons and their corresponding months mentioned in the first paragraph had ceased to represent the actual state of things in the writer's time and province, and not thinking it desirable or possible to expunge or correct the old paragraph, he added immediately after it a second paragraph describing the seasons as he saw them. The words "*but here*" at its beginning, the assignment of four months to the rainy season, but under two different names of Prâvṛiṣh and Varshâ, to keep up the old *number* of the seasons, and the absence of any reference to the *ayanas*, the year and the lustrum described in the previous paragraph—all point to the conclusion that the second paragraph is of later origin and inserted with a view only to note the changes in the occurrence of events described in the paragraph next preceding it. It might be contended that the second paragraph is that of Shushruta, who notices the old order of things in the first. But I need not go into that question here. For in either case it is plain that the passage wherein Phâlguna and Chaitra are assigned to Vasanta is the production of a later writer, whosoever he may be whether Shushruta or any one else, and as far as our present inquiry is concerned we cannot take the passage as an authority for holding that Phâlguna was a Vasanta month in the days of the Taittirîya Sanhitâ. I may however remark, that Vâgbhaṭa who professes to summarise the works of Shushruta and Charaka gives the order and description of seasons as we find it in the first paragraph in Shushruta,* without alluding

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*Ashṭângahṛidaya Sûtrasthâna iii. 1., "मासैर्द्विसंख्यैर्माघाद्यैः क्रमात् षडृतवः स्मृताः। शिशिरोऽथ...।"

to the changes noted in the second paragraph. We may, therefore, suppose that either the paragraph did not exist in Vâgbhaṭa's time or that he did not regard it as genuine.

There is thus no reliable authority, that I am aware of, for holding that Phâlguna, in the days of the Taittirîya Sanhitâ, was a Vasanta month, and Sâyaṇa's explanation does not in consequence hold good at least in this case. The explanation is further inconsistent with the fact that in several Brâhmaṇas and Sûtras the full-moon night in the month of Phâlguna has been pronounced to be the *first night* of the year. The Shatapatha Brâhmaṇa (vi. 2. 2. 18) says "the Phâlgunî full-moon is the first night of the year." The Taittirîya (i. 1, 2, 8) and the Sânkhyâyana (iv. 4 and v. 1)* Brâhmaṇas contain similar passages, while the Gopatha Brâhmaṇa (i. 19) after stating that the Uttarâ and the Pûrvâ Phalgunî are respectively the beginning and the end of the year, adds "just as the two ends of a thing meet so these two termini of the year meet together."† I have already quoted a passage from the Tâṇḍya Brâhmaṇa to the same effect. The Sûtra-writers, though not so explicit, do however distinctly state that the annual sacrifices "should be commenced either on the Chaitrî or the Phâlgunî full-moon night,"‡ thus clearly indicating that these were regarded as the beginnings of the

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* एषा ह संवत्सरस्य प्रथमा रात्रिर्यत्फाल्गुनी पौर्णमासी Shat. Br. vi. 2. 2. 18. एषा वै प्रथमा रात्रिः संवत्सरस्य यदुत्तरे फल्गुनी। मुखत एव संवत्सरस्याग्निमाधाय वसीयान् भवति। Taitt. Br. i. 1. 2 8, मुखं वा एतत्संवत्सरस्य यत्फाल्गुनी पौर्णमासी। Sân. Br. iv. 4.

† मुखमुत्तरे फल्गुन्यौ पुच्छं पूर्वे । तद्यथाप्रवृत्तस्यांतौ समेतौ स्यातां। एवमेतत्संवत्सरस्यांतौ समेतौ भवतः।

‡ तेषां (*scil*, सांवत्सरिकाणां) फाल्गुन्यां पौर्णमास्यां चैत्र्यां वा प्रयोगः। Âshvalâyana Shr. Su. i. 2. 14, 3; Kât. Shr. Su. v. 1. 1; Sân. Shr. Su. iii. 8. 1., xiii. 18. 3.

year. If these passages mean anything, we must hold that the Phâlgunî full-moon night was once considered to be actually the *first* night of the year, or to put it in a modern form the new year's night. We cannot assign this position to it by simply assuming, as Sâyaṇa has done, that the night occured *sometime* during the two months of Vasanta. Sâyaṇa, it appears, was aware of this objection and so in commenting on the passage from the Taittirîya Sanhitâ, quoted in the last chapter, he attempts to explain the position of the Phâlgunî night by reference to the above mentioned passages in the Brâhmaṇas; while with respect to the Chaitrî, he quietly observes that "this *too* is the mouth of the year as it falls during the season of Vasanta."* But an explanation that admittedly fails in one case must fail in the other, for the Chitrâ and the Phâlgunî nights are described together, in the *same* passage and in the *same* words, as the beginnings of the year.

It will be clear from the above, *first*, that the theory of the lunar seasons, started by Sâyaṇa to account for the position assigned to the Phâlgunî night in the Vedic works, cannot have a permanent place in the Vedic calendar; *secondly*, even accepting the theory, the beginning of the solar Vasanta might be put off to the month of (lunar) Vaishâkha, but could not be brought back to any day in Phâlguna; and *thirdly*, the express texts in the Brâhmaṇas declaring the Phâlgunî full-moon to be the new-year's night are inconsistent with Sâyaṇa's explanation. We must therefore look for some other solution.

But if Sâyaṇa's explanation cannot be accepted, at

* See the original remark quoted *supra*. The word "*too*" in this explanation implies that it holds good also in the case of the Phâlgunî full-moon.

least with respect to the Phâlgunî night, how are we to interpret the several passages in the Sanhitâ and the Brâhmaṇas given above? We cannot suppose that the Phâlgunî full-moon commenced the year at the vernal equinox; for then we shall have to place the vernal equinox in Uttarâ Bhâdrapadâ, which to render possible in the pre-Kṛittikâ period we must go back to something like 20,000 B. C. The only other alternative is to make the full-moon commence the year, at the winter solstice, and from the fact that the Mâghî, the Phâlgunî and the Chaitrî full-moons are mentioned together in the *same* passage of the Taittirîya Sanhitâ, and for the *same* purpose, I conclude that this is the real meaning of the passage in the Taittirîya Sanhitâ and those in the Brâhmaṇas. It is the most natural and reasonable interpretation of the passage and I find that Bhâskara Bhaṭṭa, who is older than Sâyaṇa, fully adopts this view in his Bhâṣhya on the Taittirîya Sanhitâ.* I have

* A MS. of Bhâskara Bhaṭṭa's Bhâshya on the Taittirîya Sanhitâ has been recently discovered at Mysore and through the kindness of Sir Sheshâdri Iyar, the Dewan of Mysore, I have been able to procure a copy of the Bhâshya on the passage here discussed. Bhâskara Bhaṭṭa after commenting on the first part of the passage which states that the sacrifice should be commenced on the Ekâshṭakâ day, makes the following observation as regards the alternative next proposed :—एवं दूषयित्वा पक्षांतरं परिगृण्हाति। फल्गुनीपूर्णमास इत्यादि। फल्गुन्या युक्तः पूर्णमासः फल्गुनीपूर्णमासः। मुखं वा इति। अत्र केचिदाहुः फाल्गुनादिः संवत्सर इति। तन्मते मुखत एव संवत्सरं परिगृह्य दीक्षा कृता भवति। As regards the third alternative proposed in the text, *viz.* the Chitrâ full-moon Bhâskara Bhatta observes further on :—अतः पक्षांतरं परिगृण्हाति। चित्रापूर्णमास इत्यादिगतं। चैत्रादिः संवत्सर इति येषां मतं तत इदानीमुच्यते। Finally Bhâskara Bhaṭṭa follows Jaimini and Shabara in the interpretation of the last part of the passage and concludes by observing the best time for the sacrifice is 4 days previous to the full-moon in Mâgha.

however devoted so much space to the discussion of Sâyaṇa's explanation as the high authority of that scholar is likely to mislead us in the interpretation of the passage. The Bhâshyâ of Bhâskara Bhaṭṭa fully shews that Sâyaṇa is not here following any older tradition and the reasons given by him for explaining the position assigned to the Phalgunî full-moon in the Vedic works are mere conjectures and guesses of his own. I admit that even the guesses of a scholar like Sâyaṇa deserve consideration. But when on a closer examination we find that they are not supported by any old traditions and are besides objectionable on various other grounds, I think we are bound to reject them. As observed by Bhâskara Bhaṭṭa the passage in the Taittirîya Sanhitâ must, therefore, be understood as referring to an older year beginning, and we must hold that the full-moon in Phâlguna did as a matter of fact once commence the year at the winter solstice. I know that this view has been regarded as improbable by some scholars, on the sole ground that it would, if substantiated, enhance the antiquity of the Vedic works by about 2000 years more than what these scholars are willing to assign to them; and as the natural result of such prepossessions amongst them the subject has till now remained uninvestigated. But I hope that they will patiently examine the evidence, direct and corroborative, which I intend to put forth in support of the suggestion and then give their judgment upon it. There is no *a priori* impossibility involved in the hypothesis that the old priests, after changing their starting point to the Kṛittikâs and framing the calendar accordingly, continued to recognize for sacrificial purposes, the older positions of the Nakshatras, just as all Brâhmans from the Himâlaya to the Cape Comorin at present

perform their sacrifices on days and at times fixed when the vernal equinox was in the Kṛittikâs. I think the present Brâhmans are worse off in this respect, inasmuch as they have not even the liberty, which the passage in the Taittirîya Sanhitâ accorded, though hesitatingly, to the old priests, of choosing either the old or the new calender. To use the words of Professor Max. Müller we must in such cases, therefore, "keep our preconceived notions of what people call primitive humanity in abeyance for a time,"* and form our judgment of antiquity, as we do of other facts, solely upon evidence.

We have seen in the last chapter that the evidence for placing the vernal equinox in the Kṛittikâs consisted of (1) the lists of the Nakshatras all beginning with the Kṛittikâs, (2) the winter solstice then falling in the month of Mâgha, (3) the Nakshatra at the summer solstice being presided over by the *pitṛis*, and (4) the possibility of considering, as Bentley suggested, the portion of the Nakshatra at the autumnal equinox as divided by the equinoctial colure. In short, if the year was supposed to have begun in the month of Mâgha, the position of the four cardinal points of the ecliptic as referred to the Nakshatras, was consistent with, and so indirectly established the truth of, such a supposition. Let us see if we can produce similar evidence for establishing the hypothesis (for it is no better at present) that the year in the old Vedic days began, as stated in the Brâhmaṇas, with the Phâlgunî full-moon, and that the winter solstice occurred on that day. On a rough calculation the vernal equinox, mnst recede two divisional Nakshatras to make the seasons fall back by one month. If the winter solstice, therefore, occurred in the month of Phâlguna, *one* month

* India: what it can teach us? p. 112.

in advance of Mâgha, in the old Vedic days, the vernal equinox must then have been in Mṛigashiras or *two* Nakshatras in advance of the Kṛittikâs. Taking the data given in the Vedânga Jyotiṣha as his basis, the late Kṛiṣhṇa Shâstri Goḍbole has thus calculated* the position of the four cardinal points of the ecliptic, when the winter solstice, as stated in the Brâhmaṇas, occurred on the full-moon day in the month of Phâlguna :—

(1) The winter solstice in 3° 20′ of the divisional Uttarâ Bhâdrapadâ ;
(2) The vernal equinox in the beginning of Ârdrâ ;
(3) The summer solstice in 10° of Uttarâ Phalgunî; and
(4) The autumnal equinox in the middle of Mûla ;

or giving up the system of reckoning by the divisional portions of the Zodiac, we have, roughly speaking, the winter solstice quite near the asterism of Uttarâ Bhâdrapadâ, the vernal equinox between the head and the right shoulder of Orion or about 3° east of Mṛigashiras, the summer solstice at a distance of within 2° east of Uttarâ Phalgunî, and the autumnal equinox about 5° east of the asterism of Mûla. If we suppose the vernal equinox to coincide with Mṛigashiras, the three other cardinal points are brought nearer to the fixed asterisms, and this appears to be the more probable position of the equinoxes and the solstices in those days. But without entering into these details, it will be evident from this that when the winter solstice fell on the Phalgunî full-moon the vernal equinox must be very near the asterism of Mṛigashiras or two Nakshatras in advance of the Kṛittikâs. We have now to see what evidence there is in the Vedic works from which this old position of the four principal points in the ecliptic may be established.

* See his essay on the Antiquity of the Vedas, p. 19.

There appears to be no express passage in the Vedic works, which states that Mṛigashiras, like the Kṛittikâs was ever the mouth of the Nakshatras. But what is so lost may still be discovered, in the words of Prof. Max Müller, "hidden in the secret drawers of language." Mṛigashiras may not be specifically described as the first of the Nakshatras; but the word *Âgrahâyaṇî* which Amarsinha (i. 3. 23), gives as a synonym for Mṛigashiras, and which supplies, according to Pâṇini, a derivative word for the month of Mârgashîrṣha tells the same tale. *Âgrahâyaṇî* literally means "commencing the year;" and the question is how did the Nakshatra come to be so called? In explaining the formation of this word all native lexicographers begin by *assuming* that the full-moon in the month of Mârgashîrṣha was the first night of the year, hence called *Âgrahâyaṇî*, and as this full-moon occurred in the month of Mârgashîrṣha the month itself was called *Âgrahâyaṇika*. There is no grammatical inconsistency so far. But when these lexicographers further tell us that the Nakshatra itself was called *Âgrahâyaṇî*, as Amarsinha has done, because the full-moon in the vicinity of that Nakshatra commenced the year in old days,* one feels that there is something wrong in this explanation. The ordinary course is to name the full-moon or any other day after the Nakshatra, as *Chaitrî*, *Pauṣham*, *Pauṣhî*, &c (Pan. iv. 2, 3), while in the present case the order is reversed and the Nakshatra, we are told, is named after the full-moon. It is true that the lexicographers were, to a certain extent,

* See Bhânu Dikshita's commentary on Amar. i. 3, 23. He explains the word thus :—अग्रे हायनमस्याः। मार्गशीर्षमारभ्य वर्षप्रवृत्तेः। प्रज्ञाद्यण्। पूर्वपदादिति णत्वम्। आग्रहायणी पौर्णमासी। तद्योगान्नक्षत्रमपि तथा।

compelled to adopt such a course, as they could not otherwise explain why *Âgrahâyaṇî*, a term usually denoting a full-moon night, should have been given as a synonym for the Nakshatra of Mṛigashiras by Amarsinha. But whatever their motive, we have now to see if their explanations, as well as the statement in Amara, are correct. Turning to Pâṇini we find no authority for this converse process. The word *Âgrahâyaṇî* occurs in Pâṇini iv. 2, 22, which lays down the rule that the derivative names of months are formed from *Âgrahâyaṇî* and *Ashvattha*, by the addition of *ṭhak*,* as a necessary termination ; and this gives us the words *Âgrahâyaṇika* and *Âshvatthika* for the months of Mârgashîrṣha and Âshvina. Now in the previous *sûtra* (iv. 2. 21) Pâṇini states that the names of the months are derived from the names of the full-moon days that occur in those months. It appears, therefore, that he understood *Âgrahâyaṇî* to mean the full-moon and not the Nakshatra of Mṛigashiras. The word *Âgrahâyaṇî* occurs thrice in Pâṇini (iv. 2. 22 ; 3. 50 ; and v. 4. 110) and in all places it denotes the full-moon day. It is not, however, clear whether Pâṇini treated it as a word derived in the same manner as *Chaitrî*, &c. If we, however, rely on analogy there is every reason to hold that *Âgrahâyaṇî*, like *Kârtikî* and *Phâlgunî*, may have been derived from *Âgrahâyaṇa*, and that this may originally be the name of the Nakshatra of Mṛigashiras. This supposition derives support from the fact that if, like Amarsinha, we take *Âgrahâyaṇî* as

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* The *sûtras* of Pâṇini referred to in this discussion are नक्षत्रेण युक्तः कालः (iv. 2. 3), सास्मिन्पौर्णमासीति संज्ञायाम् (iv. 2. 21), आग्रहायण्यश्वत्थाट्ठक् (iv. 2. 22.), षिद्गौरादिभ्यश्च (iv. 1. 41.) and प्रज्ञादिभ्यश्च (v. 4. 38).

synonymous with the Nakshatra of Mṛigashiras and follow the native grammarians in deriving this name of the Nakshatra from that of the full-moon, it is very difficult to account for the initial long vowel in *Âgrahâyaṇî.* All lexicographers derive the word from *Agra* and *Hâyana* combined in a Bahuvṛîhi compound and afterwards adding the feminine termination ; thus *Agra* + *hâyana* + *î*. But the feminine termination cannot be added without a previous suffix (*aṇ*) which also gives the initial long vowel, as *î* is not a general feminine suffix, but is only used in special cases. We cannot get this *aṇ* by Pâṇini iv., 2. 3, as *Âgrahâyaṇa* is not the name of a Nakshatra according to Amarsinha. Various suggestions have, therefore, been made to account for the initial long vowel. Bhaṭṭoji suggests that we should obtain the long vowel by including *Âgrahâyaṇa* in the Prajnâdi list (Pan. v. 4. 38) ; but in the Gaṇapâṭha, the list is not said to be a 'specimen list',* nor is the word *Âgrahâyaṇa* specifically included in the list there given. Boehtlingk and Roth in their dictionary obtain the long vowel by Pan. v. 4. 36 ; but here 36 may probably be a misprint for 38. Târânâtha in his Vâchaspatya obtains the long vowel by Pâṇini v. 2. 102, Vârtika 1; but Jyotsnâdi is not again expressly said to be a 'specimen list.' Bhānu Dikṣhita, the son of Bhaṭṭoji, in his commentary on Amara† adopts his father's view and refutes that of Mukuṭa. The latter obtains the initial long vowel from the very fact that the word itself is so pronounced by Pâṇini in iv. 2. 22 ; but this gives us *Âgrahâyaṇî* as a ready made

* आकृतिगण:, meaning that the list is not exhaustive.

† See p. 62 of the Bombay Ed. of Bhânu Dikshita's com. on Amara.

word at once, and Mukuṭa had to assign some reason why the word should have been again included in the Gaurâdi list in Pan. iv. 1. 41. Mukuṭa's explanation is that Pâṇini thereby intends to show that the feminine termination in *Âgrahâyaṇî* is not dropped in compounds. But Bhânu Dikṣhita replies by observing that the Gaurâdi list was never intended for the purpose and that as regards the accent we can get it otherwise. Bhânu Dikṣhita's own explanation or that of his father Bhaṭṭoji also dispenses with the necessity of including the word in the Gaurâdi list as they obtain the feminine suffix *î* by Pan. iv. 1. 15; and so in replying to Mukuṭa he observes at the end that the "inclusion of the word in the Gaurâdi list is questionable." Thus if we suppose Amarsinha to be correct and accept either Bhaṭṭoji's or Mukuṭa's derivation of *Âgrahâyaṇî* we shall have to hold that the word in question was either wrongly included or subsequently inserted in the Gaurâdi list and that Pâṇini, who knew the word, forgot to insert it in the Prajnâdi or the Jyotsnâdi list. Both the explanations are again open to the objection that in this instance the Nakshatra is named after the full-moon as against the usual method given by Pâṇini in iv. 2. 3.

The whole of this difficulty, however, vanishes, if we give up the notion, that the full-moon night in the month of Mârgashîrṣha might have commenced the year at one time and that the name of the Nakshatra as given by Amara must be derived from the name of the full-moon. There is no express authority in the Vedic works to support such a theory and a closer examination of Pâṇini's *sûtras* points to the same conclusion. Months in the Hindu calendar receive their names from the full-moon nights occuring in them; and the characteristics of a month are the same as

those of the full-moon night after which it is named. If the full-moon night in Mârgashirṣha was, therefore, ever the new-year's night then the month itself would have come to be properly called the first month of the year. In other words the month of Mârgashîrṣha would itself, in that case, be called *Agrahâyaṇa*. Boehtlingk and Roth do interpret the word *Agrahâyaṇa* in this way on the authority of Shabda-kalpa-druma and Târânâtha has done the same probably on the same authority, for none quotes any passage where the word is so used. Now if *Agrahâyṇa* ever meant the month of Mârgashîrṣha the word would also assume the form *Âgrahâyaṇa* on the ground given above by Bhaṭṭoji ;* and we shall have *Âgrahâyaṇa* as another name of the month of Mârgashirṣha. The word occurs in the Gaurâdi list (Pan. iv. 1. 41), and therefore must be taken to have been known to Pâṇini. What did he understand it to mean ? There is strong ground to hold that he could not have understood it to mean the month of Mârgashirasha. For if we suppose that in Pâṇini's times there were two forms of the word in this sense—*Âgrahâyaṇa* and *Âgrahâyaṇika*—he would have rather mentioned *Agrahâyaṇî* in iv. 2. 23,† along with *Chaitrî*, &c., which gives the double forms *Chaitra* and *Chaitrika* and not with *Ashvatta* in iv. 2. 22† as he has now done. We may, therefore, infer that *Agrahâyaṇika* was the *only* sanctioned form of the word to denote the

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* Bhânu Dikshita, in his commentary on Amara i. 4. 84, gives *Agrâhayaṇa* as a synonym for Mârgashirsha on the authority of Purushottama and obtains the initial long vowel by including the word in the Jyotsnâdi iist.

† The *sutras* are—आग्रहायण्यश्वत्थाट्टक् (iv. 2. 22) विभाषा फाल्गुनीश्रवणकार्तिकीचैत्रीभ्यः (iv. 2. 23). As the *sutras* follow each other it is natural to suppose that *Agrahâyaṇî*, if it gave rise to two forms, would have been included in the second *sutra.*

month of Mârgashîrṣha in Pâṇini's time. This means that Pâṇini did not know of the theory which makes the year commence with the Mârgashîrshî full-moon night or the month of Mârgashîrṣha (*Âgrahâyaṇa*). If so, he could not have derived the word *Âgrahâyaṇî* for the full-moon night directly by taking it to be a Bahuvṛihi compound.* The only other alternative is to derive it as we derive *Chaitrî* and other similar words, and I think this is what Pâṇini meant. For if he had been aware of any such difficulty in the formation of *Âgrahâyaṇî*,—a word thrice used by him,—and especially in in obtaining the initial long vowel as Bhaṭṭoji and others have felt by taking it to be a Bahuvṛîhi compound, he would have naturally noticed it himself. I therefore conclude that Pâṇini derived *Âgrahâyaṇî* from *Âgrahâyaṇa*, as the name of a Nakshatra. In this case we can derive *Âgrahâyaṇî* in a simple and easy manner. For by Pâṇini iv. 2. 3, we get the initial long vowel, when derivative words are formed from the names of the Nakshatras to express time ; we now want the feminine suffix *î*, and though this could have been obtained by Pân. iv. 1. 15, yet, for accentual purposes, it may be considered as provided for by the inclusion of the word *Âgrahâyaṇa*† in the Gaurâdi list in Pan. iv. 1. 41. We can thus derive the word in the ordinary way, and unless we have strong grounds to maintain that it was really the full-moon night and not the Nakshatra, which commenced the year, we shall not be justified in accepting unusual derivations and explanations of these words. It is true that the word

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* For then the full-moon night, and hence the month, would itself be the commencement of the year.

† Doubts have been raised as to the exact form of the word mentioned in the Gaurâdi list, and Bhânu Dikshita goes so far as to question whether the word was really included in the list by Pâṇini.

Âgrahâyaṇa as denoting a Nakshatra is now lost and Amarasinha only gives *Âgrahâyaṇî* and not *Âgrahâyaṇa* as a synonym for the Nakshatra of Mṛigashiras. But I shall presently show that Amarasinha is not alone in misconceiving the meaning of these old words. The theory that the Mârgashîrṣhî full-moon was the first night of the year, has been the source of many other errors in later literature; but before examining these it was necessary to show how the theory has distorted the natural meaning and derivation of the very words on which it appears to have been based. As remarked above if there be any express or cogent authority to support the theory we might connive at the etymological difficulties, but if it be found that the theory is inconsistent with many other facts, or leads, as I shall presently show, to absurd results, the etymological distortions would afford us an additional ground for rejecting it.

We shall now examine in detail the theory that the full-moon night in Mârgashîrṣha was once the first night of the year. So far as I am aware there is no express authority for such an hypothesis except the statement in the Bhagavad-Gîtâ (x. 35) where Kṛishṇa tells Arjuna that he, Kṛishṇa, is " Mârgashîrṣha of the months (and), Vasanta of the seasons." Ânandagiri in his gloss on Shankara's Bhâṣhya upon the Gîtâ, observes that Mârgashîrṣha is here specially selected because it is a month of plenty. But the reason does not appear to be either sufficient or satisfactory; for the next sentence, and in fact the whole context, shows that Mârgashirṣha was here intended to be the first of the months. The principle commentators on the Gîtâ are too philosophical to notice this point, but in a commentary written by Sûrya Pandit, an astronomer, entitled the Paramârtha-prapâ, I find that he explains

the statement on the ground that Mârgashîrṣha was otherwise called *Âgrahâyaṇika*, and the latter word denotes that the full-moon night in this month was the first night of the year.* If we accept this explanation, and no other plausible one is forthcoming, it appears that this statement in the Bhagavad-Gîtâ was based on an etymolcgical misconception of the meaning of the term *Âgrahâyaṇika*; and later writers like Amarasinha and Vâgbhaṭa,† simply followed the Gîtâ in assigning the same position to the month of Mârgashîrṣha. We may, therefore treat all these statements as coming from one source and representing a certain period of the Sanskrit literature, when native scholars first misconceived the primary meaning of *Âgrahâyaṇika*. I have already shown that, properly understood, the etymology of the word gives little room for such a misconception. *Âgrahâyanika* is really a derivative word and cannot therefore mean that the month denoted by it was the first in the year just as Jyeṣhṭha does not mean the eldest month. But it appears that the tradition about Mṛigashiras (*Âgrahâyaṇa*) ever being the first of the Nakshatras, was completely lost in those days, and native scholars

* The commentary is printed at Poona. The words in the original are—यद्वा मृगशिरः पूर्णिमासंबंधेन वर्षादिरभिहितस्तस्मिन्नेवाग्रहायणीत्याभिधानात्। आग्रहायणं यस्यां साग्रहायणी। अत एवाग्रहायणिक इति मार्गशीर्षनाम्न। अतोऽस्य मासस्य मुख्यत्वाद्विभूतिमत्वम्.। If Anandagiri's explanation be correct then the Gîtâ is not opposed to deriving *Agrahâyanî* from *Agrahâyana*, the name of a Nakshatra, and the whole of the above discussion would be unnecessary.

† Vâgbhaṭa, in his larger work entitled Ashtângasangraha, otherwise called Vṛiddha Vâgbhaṭa, enumerates the months as beginning with Mârgashîrsha. In i, 4 of the work the Uttarâyaṇa is said to commence with Mâgha, while Mârgashîrsha is mentioned first amongst the months there enumerated, much after the same way as Amara has done in i. 4, 13 and 14.

believed, on what they considered to be sound etymological grounds that the month and not the Nakshatra was the commencement of the year. Once started and embodied in the Gîtâ, the theory gained an easy and rapid currency amongst native scholars, all of whom naturally felt bound to shape their views accordingly.

And not only literary scholars, but astronomers appear to have done the same. In old astronomical works the year commenced with the winter solstice and the first month of the year meant the first month of the Uttarâyaṇa which commenced with this solstice. If then the Mârgashîrṣhî full moon was said to be the first night of the year, an astronomer would naturally understand such statement to mean that the winter solstice fell on the full-moon day of Mârgashîrṣha. Now if we suppose that the Mârgashîrṣhî full-moon was thus the night of the winter solstice, it would mean that the full moon on that day happened to be near the asterism of Mṛigashiras. With the sun at the winter solstice, the moon, to be full, must be near the summer solstice ; and therefore the summer solstice must have then coincided with the asterism of Mṛigashiras. The vernal equinox is 90° behind the summer solstice ; and if Mṛigashiras coincided with the latter, the vernal equinox would then be 90° behind the asterism of Mṛigashiras. This is the only logical and mathematical conclusion possible if we accept the theory that the full-moon night in Mârgashîrṣha was the first night of the year at the winter solstice. And what does it mean? It means a clear mathematical absurdity to us, though older astronomers, not realizing its full effect, invented an explanation to account for it. The Sûrya Siddhânta (viii. 2. 9) gives 63° as the polar longitude of Mṛigashiras, counting from Revati. Now if the vernal

equinox was 90° behind the asterism of Mṛigashiras, it was 90°—63° = 27° behind the asterism of Revati !* The Vedic-works, on the other hand, mention the Kṛittikâs as the first of the Nakshatras, and the winter solstice is shewn to have then occurred in the month of Mâgha. This means that the vernal equinox must be placed at least 26° 40', or nearly 27° in front of Revati. Now imagine the position of the Indian astronomer, who could neither reject the statement in the Vedic works, nor the one in the Bhagvad Gîtâ. Both were sacred and unquestionable texts, and it would be no wonder if, to his great relief, he got over the difficulty by proposing a libration of the equinoxes, 27° on either side of Revati ! The hypothesis is now given up by modern astronomers as mathematically incorrect ; but no reason has yet been assigned why it found place in the Hindu astronomy. A theory may be erroneons, but even an erroneous theory cannot become prevalent without a good cause. It has been suggested by Bentley and approved by Prof. Whitney †, that the limits of the libration might have been determined by the fact that the earliest recorded Hindu year had been made to begin when the sun entered the asterism of Kṛitikâ or 26° 40′ in front of Revati. But this alone is not enough to suggest the theory of libration. For, unless the Hindu astronomer had grounds—to him conclusive and

* This may imply that the Sūrya Siddhânta was in existence at the time when the libration theory was started. I think it was. But it has been suggested that the libration theory might have been subsequently inserted therein (see Whîtney's Sur. Sid., p. 104). It is not, however, necessary to make any supposition regarding the existence of the Surya Siddhânta at this time. as almost all other Siddhântas give the same *bhoga*, viz., 63° for Mṛigashiras. See Colebrooke's Essays, Vol ii., p. 325 (table).

† See Surya Siddhânta, p. 103.

otherwise inexplicable—for holding that the vernal equinox fell 27° on *each* side of Revati, he would not have proposed the libration of the equinoxes. So far as I know no such grounds have been yet discovered by modern scholars, and if the explanation given above accounts for the theory in all its details, I see no reason why it should not be accepted as a probable explanation. Perhaps, it may be asked, what grounds I have to suppose that the astronomers combined the two statements declaring that Mâgha and Mârgashîrṣha were both, each in its turn, the first months of the year, and so obtained the theory of the libration of the equinoxes. This is, however, not the place to go fully into this discussion; for all that I am bound to prove, as far as the present inquiry is concerned, is that if we accept the theory that the Mârgashîrṣha full moon was ever the new-year's night, it leads us to an absurd conclusion, and this is evident from the above whether it does or does not give the real explanation of the libration theory. I may, however, remark that when we actually find Amarasinha first stating (i. 4. 13) that "seasons comprise two months each beginning with Mâgha, and three such seasons make an *ayana*," and then in the very next verse enumerating the months commencing with Mârgashîrsha; there is nothing extraordinary in the supposition that some Hindu astronomers might have similarly attempted to reconcile what were then regarded as the two beginnings of the year, by placing the statements in juxtaposition and pushing them to their logical conclusions. On the contrary, I should have been surprised if the Hindu astronomers had not done so.

But, apart from the origin of the libration theory, I think it is clear that, if we accept that the Mârgashîrṣha full-moon was ever a new-year's night, in the sense that the winter

solstice occurred at that time, we are inevitably landed on an absurdity. By the ordinary proces of *reductio ad absurdum*, we are thus compelled to abandon the theory that the full moon in Mârgashîrṣha once began the year at the winter solstice. Native scholars and astronomers, who did not realize the absurdity, accepted the theory of the libration of the equinoxes as the only possible way of reconciling the two statements in their sacred books. We now know that the equinox cannot be placed 27° behind Revati, unless it be either in the beginning of the present cycle of the precession of the equinoxes or about 600 years hereafter, and we should have no difficulty in rejecting the premises that give us such a conclusion. Perhaps it may be urged that the full-moon night in Mârgashîrṣha might have been called the new-year's night in some other sense.* Yes, it

* The only other explanation, I know of, is that given by Bentley in his Historical Survey of Hindu Astronomy, pp. 5-27. Bentley divides the zodiac into 27 lunar mansions, beginning with Shravishthâ in the winter solstice, as in the Vedânga Jyotisha. Then he divides it again into 12 tropical months beginning with Mâgha. The beginning of Mâgha and the divisional Shravishthâ thus coincide at this time. Now the beginning of each month must fall back owing to the precession of the equinoxes; and in thus receding if the beginning of *any* month coincided with *any* fixed lunar mansion, on the 6th lunar day, the month, says Bentley, was made to commence the year! But what authority is there in native astronomical works for such an elaborate and artificial theory to determine the commencement of the year? Native astronomers are surely expected to know better the theory on which they commenced their year. Then, according to Bentley's calculation, Âshvina was the first month in 1192 B. C. and Kârtika in 945 B. C. But there is no evidence whatsoever in the Sanskrit literature to corroborate these results. Again why should either of these months not have been called *Âgrahâyanika?* Bentley supposes that this method was in force till

might be; but what evidence is there that any *native* scholars ever thought of it? None that I know of. There are only two beginnings of the year known in ancient Hindu literature. I have shown that the winter solstice could not have occurred on the full-moon in Mârgashîrṣha, and by the same method we can prove the improbability of the vernal equinox falling on that day. For if we suppose the Mârgashîrsha full-moon to be the new-year's night, in the sense that the vernal equinox occurred on that date, we must make the asterism of Abhijit coincide with the vernal equinox. This gives us about 20,000 years B. C. for the period when these positions could have been true. The author of the Bhâgavata Purâṇa appears to have had some such theory in his mind when he paraphrased (xi. 16. 27) the above quoted verse in the Gîtâ by "I am Mârgashîrṣha of the months, Abhijit of the Nakshatras," and the late Kṛiṣhṇa Shâstri Goḍbole took this statement for a record of a real tradition! This illustrates the danger of relying on traditions in later books, without tracing them to their source in the oldest works we possess.

We must therefore rise above these etymological speculations of the native scholars of what Prof. Max Müller once called the Renaissance period of the Sanskrit literature. It is these speculations that have given us the libration theory

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538 A. D.; if so, why should Pausha not become *Âgrahâyaṇika* instead of Mârgashîrsha, in 451 B. C.? Bentley's *unsupported* speculatiou must, therefore, be rejected as imaginary. It gives no reason why Mârgashîrsha, the third of the several months which, according to his theory, would successively begin the year from 1193 B. C. to 538 A. D., should alone have been called *Âgrahâyanika* and none whatever why the Nakshatra should be called *Âgrahâyanî* contrary to the usual rule, according to which the word should denote the full-moon day.

and interrupted the tradition of *Agrahâyaṇa* coming down to us intact. It is difficult to say how these etymological speculations originated. Perhaps the word *Âgrahâyaṇika* was in course of time corrupted by nonuser into *Âgrahâyaṇa* on the analogy of *Chaitra* and *Chaitrika*, and such corruption gave rise to these speculations, or it might be that the year locally commenced with Mârgashîrsha in certain provinces, and attempts were made to find an authority for such custom in the etymological meaning of the word *Âgrahâyaṇika*. It appears to me more probable, however, that the old tradition about the Nakshatra gradually got connected with the month which was named after it as in the case of Kârtika, whose first rank amongst months is suggested by Prof. Whitney "as due to the ancient position of the Krittikâs as the first among the lunar mansions."* This is very likely if, as shown below, the word *Âgrahâyaṇî* was ever used to denote both the Nakshatra and the full-moon. But whatever the origin, the speculation was there safe under the authority and prestige of the Bhagavad Gîtâ, and Amarasinha, who appears to have been not wholly free from the influence of such theories, naturally put down *Âgrahâyaṇî* instead of *Agrahâyaṇa*, as the name of the Mṛigashiras, especially as the latter word, *Agrahâyaṇa*, was not expressly mentioned by Pâṇini. Later lexicographers, who considered Amara and especially the Gîtâ to be above error, attempted to reconcile Amara's statement with the system of Pâṇini by unusual derivations, and astronomers appear to have vied with them in mathematically reconciling the real and the imaginary beginnings of the year! We must, therefore, set aside all these theories and go back to the purer times of Pâṇini, to

* See his Surya Sidbhânta, p. 271 (xiv. 16 *n*.)

For says he "Mṛigashirṣham (is) Mṛigashiras; *Âgrahâyaṇî* (is used) to denote *the very same**;" thus implying that a feminine word is used to denote what he supposed might be regarded only in the neuter gender. This is, indeed, a plausible explanation. It not only absolves Amarasinha from the charge of having given a wrong, or at least a distorted, word, but makes him warn his readers not to misunderstand the word *Âgrahâyaṇî* for the full-moon night—a mistake into which almost all his commentators have, however, unfortunately fallen. It may further explain why instead of the Nakshatra, the full-moon day (both of which were on this theory denoted by the same word *Âgrhâyaṇî*) came to be regarded as the first night of the year and so gave rise to later speculations. But the fact that Amarasinha mentions Mârgashîrṣha first amongst the months shows that he was not altogether free from the influence of the speculative theory; and the explanation above stated must therefore be accepted with caution.

But whatever explanations we may adopt to defend Amara, I think it will be plain from the above that, so far as our purpose is concerned, we must reject the explanations of the commentators of Amara, who derive the name of the Nakshatra, as given by Amara, from *Âgrahâyaṇî*, the name of the full moon. After this we may either suppose *Agrahâyaṇa* or *Âgrahâyaṇî*, or *Agrahâyaṇî* to be the name of the Nakshatra, for in every case the difference consists only in the *form* and *gender* and not in the *derivation*, or the meaning of the word. Thus understood *Âgrahâyaṇî* or *Agraâyaṇa* both give us the same meaning, *viz*., that *the year was in the front of the Nakshatra of Mṛigashiras*; or in other

* Thus:—मृगशीर्षं मृगशिरस्तस्मिन्नेवाग्रहायणी । Why तस्मिन्नेव ?

words *commenced with it.* If what I have said above is enough to prove this, I do not care to insist on a particular form, whether masculine, feminine, or neuter, of *Agrahâyaṇa* which as an adjective is the basis of all such forms. With this reservation, I may, I think, in what follows use the word *Agrahâyaṇa* to denote the Nakshatra of Mṛigashiras and as evidencing the circumstance that it was so called because it was the first Nakshatra in the year.

Corresponding to the winter solstice in Phâlguna, we thus have the asterism of Mṛigashiras or *Agrahâyaṇa* to commence the year from the vernal equinox, much after the same manner as the Kṛittikâs were said to be the mouth of the Nakshatras when the winter solstice fell in the month of Mâgha. The express statement in the Brâhmaṇas that the Phâlgunî full-moon commenced the year from, as I have previously shown, the winter solstice, is thus borne out by the tradition which we find treasured up in *Agrahâyaṇî.* Now if the vernal equinox was near the asterism of Mṛigashiras the autumnal equinox would be in Mûla. It has been ingeniously suggested by Bentley that this name signifying "root or origin" may have been given to the Nakshatra because it was once the first amongst the asterisms and he has actually given a list of the Nakshatras beginning with Mûla; but he does not appear to have used it except to show that when one of the twenty-eight Nakshatras was dropped the divisional Jyeshṭhâ and Mûla both began from the same fixed point in the heavens,—a position which gives him the vernal equinox in the beginning of the Zodiacal portion of the Kṛittikâs. I have already shown that we cannot suppose that the old Vedic priests made observations of imaginary lines in the heavens, and Bentley's explanation which entirely depends

on the mathematical divisions of the Zodiac is not therefore satisfactory. Nor can I accept Prof. Whitney's suggestion that Mûla "may perhaps have been so named from its being considerably the lowest or farthest to the southward of the whole series of asterisms and hence capable of being looked upon as the root of all the asterisms."* I should rather suggest that Mûla was so called because its acronycal rising marked the commencement of the year at the time when the vernal equinox was near Mṛigashiras and the winter solstice fell on the Phâgunî full-moon. *Agrahâyaṇa* setting with the sun in the west and Mûla rising in the east then marked the beginning of the year, and this position of Mûla is likely to be especially noted as the heliacal rising and setting of a star, and so of *Agrahâyaṇa*, is difficult to be accurately watched. The etymological meaning of Mûla may thus be said to supply a sort of corroborative evidence for placing the vernal equinox in Mṛigashiras though, in absence of other strong grounds, it is of no better value than a similar conjecture of Bentley about the name Vishâkhâ, noticed in the last chapter.

I have already mentioned before that the year was divided into two *ayanas*, the northern and the southern, and that though originally the northern *ayana* indicated the passage of the sun to the north of the equator yet it afterwards came to indicate the passage of the sun from the winter to the summer solstice. I have also stated that after this change was made all the attributes of the older *ayanas* must have been gradually transferred to the new ones, though the old division was concurrently kept up; and that the new ideas were formed solely with reference to the sol-

* See his Sûrya Siddhânta, p. 194.

stitial division of the year. Thus the Pitriyâna during which time the sun in older times went down the equator must have come to be regarded, for some purposes at least, as commencing from the summer solstice. With the winter solstice occurring on the Phâlguni full-moon day, we shall have the summer solstice on the Bhâdrapadî full-moon, so that the dark half of Bhâdrapada was the first fortnight in the Pitṛiyâna, understood as commencing on the summer solstice. It was thus pre-eminently the fortnight of the *pitṛis* or the manes; and *to this day*, every Hindu celebrates the feast to the manes in this fortnight. As far as I know no reason has yet been advanced why the dark half of Bhâdrapada should be called the fortnight of the *pitṛis* (*pitṛi pakṣha*) and why special feasts to the manes should be ordained at this particular period of the year. With the winter solstice in the asterism of Uttarâ Bhâdrapadâ, that is when it occurred on the Phâlgunî full-moon, the matter is simply and satisfactorily explained. For then the Dakṣhiṇâyana or summer solstice commenced on the dark half of Bhâdrapadâ and this fortnight therefore naturally became the *first* fortnight in the *ayana* of *the manes*.*

And not only the Hindus but the Parsis celebrate their feast to the manes at the same time. The coincidence is

*This explanation implies that the feast to the manes became permanently fixed at this time; and there is nothing improbable in it. For as the Parsis hold similar feasts on corresponding days we must suppose that these feasts became fixed long before the Parsis and the Indians separated. When the vernal equinox receded to the Krittikâs the feasts still continued to be celebrated in the dark half of Bhâdrapada. But though the priests could not alter the days of these feasts, yet in assigning deities to the Nakshatras they recognised the change by making *pitris* preside over Mâgha at the summer solstice.

important inasmuch as we are here dealing with periods of antiquity when the Indian, the Iranian, and Hellenic Aryas must have lived together, and if our theory is correct it is sure to be corroborated by the customs, practices, and traditions of the other two sections of the Aryan race. I shall in the next two chapters show that there is ample independent evidence of this kind confirmatory of the theory that Mṛigashiras commenced the equinoctial year in those early days. At present I shall only refer to the conclusions of Dr. Geiger as to the nature of what he calls the primitive or the oldest Avesta calendar. He takes *madhyaryo*—which literally means not 'mid-winter,' but 'mid-year'—as his basis and concludes that in the primitive Avesta calendar the year commenced with the summer solstice.* This is just what we should expect. The Indian Aryans commenced their year from the winter solstice or the beginning of the Uttarâyaṇa and the Iranians, who in such matters always took a diamatrically opposite view, naturally commenced it with the summer solstice the beginning of the Dakṣhiṇâyana, thus bringing the *Bruma* (or the winter solstice) in the middle of the year. But the coincidence does not stop here; and in the light of the old Indian calendar we are in a position to explain some difficult points in the primitive Avesta calendar. The Hindu *pitṛi-pakṣha* or the fortnight of the manes commenced with the summer solstice, while the Iranians celebrated their feasts to the manes just at the same time. The first month in their calendar was called *Fravashinam* or the month of the manes, and, according to the primitive calendar determined by

* See Dr. Geiger's Civilization of the Eastern Iranians in Ancient Times, translated by Darab Dastur Pheshtotan Sanjana, Vol. 1., p. 153.

Dr. Geiger, this first month, whem the feasts to the manes were celebrated, * began with the summer solstice. Again the fourth month of the Avesta calendar was Tishtryehe or the month of Tistrya, which has been identified with the star Sirius. Counting with Bhâdrapada in the summer solstice, the fourth month in the Hindu calendar would be Mârgashîrsha or the month of Mrigashiras, which Nakshatra is quite near Sirius. We can now also easily explain why *Dathusho* should have been dedicated to the Creator. Beginning with *Fravashinam* in the summer solstice, *Dathusho* begins exactly at the vernal equinox, and as marking the revival of nature it was properly dedicated to the Creator. Roth again was partially correct when he imagined that *Dathusho* must have once commenced the year inasmuch as it was dedicated to the Creator Ahuramazda. For from the old Hindu calendar we see that the vernal equinox was also a beginning of the year. In the primitive Avesta calendar we can thus discover the traces of the year, beginning with the vernal equinox and also from the summer solstice (in opposition to the Hindu winter solstice) in Bhâdrapada, the month of the manes. These coincidences, especially about the month of the manes, cannot be said to be merely accidental. The worshippers of Ahuramazda

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* The last five days of the old year and the first five days of the new year are called "Fravardigan" days. "During these ten days the *frohars* (*fravashi* or *fravarti*) the spiritual representatives of the deceased are believed to come to the houses" of men on the earth. See Dr. Haug's Essays on the Parsis, p. 225 note. At present the Hindu feasts extend over the whole of the fortnight. We, however, find an alternative period recorded in the Nirṇaya Sindhu, which states that the feasts may extend over a fortnight, ten days or five days!

changed the commencement of the year from the winter to the summer solstice, but as observed by Roth "a sacred and solemn feast could not be removed from its place in the year," * and this affords therefore a comparatively reliable ground to identify the Avesta and the Vedic year. We find nothing in the Avesta to explain why the first month of the year should have been devoted to the manes; but, as observed by Dr. Geiger in respect of the legend of Yama, the knowledge of it might in course of time have been lost to the worshippers of Ahuramazda. We can, however, now easily explain it from the statement in the Vedic works that Phâlgunî full-moon was once the new year's night at the winter solstice. I know that such analogies taken singly are of no great practical value, but when from a consideration of the Vedic literature, we arrive at results, which we *then* find so similar to those arrived at independently by Zend scholars, we may certainly be led to believe that they are not merely accidental.

To sum up: Interpreting the passage in the Taittirîya

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* See Dr. Geiger's Civ. An. Iran., Vol. I., p. 145. The annual feasts to the manes amongst the Parsis came after the Gahânbars and it is interesting to note that the *pitri paksha* is defined in the Sûrya Sidhânta, xiv. 3–6, as the period of 16 days after the four *Shadashîtit-mukhas* or festivals at intervals of 86 days each beginning with Libra. The author of the Sûrya Sidhânta is here evidently describing some old festivals and as *Râshis* were in use in his days he fixes the duration of these festivals according to the calendar then in force. The mention of Libra does not therefore prevent us from regarding *Shadashîti mukhas* as old festivals. But whether *Shadashîti mukhas* were in any way connected with the Gahanbârs it is not easy to determine in the present state of our knowledge of these festivals.

Sanhitâ, which states that the "*Phalgunî-pûrṇa-masa* is the month of the year," in the natural way suggested by the context and similar other passages in no less than five Brâhmaṇas, to mean that the winter solstice occurred on the Phalgunî full-moon in those days, we find that Mṛigashiras has been designated by a name, which, if properly understood, denotes that it was the first of the cycle of the Nakshatras, thus showing that the vernal equinox was once near it; that Mûla can now be better understood as the star that rose at the beginning of the first night of the equinoctial year; and finally the fortnight after the summer solstice was devoted to the feast of the manes, as the *ayana* of the *pitṛis* commenced at that point; and that this is fully corroborated by the Parsi month of the manes falling in their primitive calendar at the same time. It was on evidence like this that the old position of the Kṛittikâs was determined, and I do not see why a similar conclusion about Mṛigashiras should not be allowed. It is true that no express statement has been cited to show that Mṛigashiras commenced the cycle of the Nakshatras in those days and that some scholars may not consider the *Agrahâyaṇî* sufficient for the purpose. In the following chapters I hope to show that there are a number of other circumstances—and even express texts—which leave little room for cautious fears like these.

CHAPTER V.

THE ANTELOPE'S HEAD.

Mṛigashiras—Its oldest form and position—Identification of Rohiṇî and Rudra, etc.—Plutarch on the non-Egyptian origin of Orion, Canis and Ursa—Methods of interpreting mythological legends—Storm and dawn theories—Their insufficiency—Knowledge of the heavens amongst the ancient Aryas—Heaven and Hell, Devayâna and Pitṛiyâna—Joined by equinoxes, the gates of Heaven—Dogs at these gates—Kerberos and Yama's dogs—The Chinvat bridge and the dogs that guard it—Their identification with Canis Major and Canis Minor, when the vernal equinox was in Orion—Celestial river and Charon's boat—Comparison of the Rigveda and the Avesta dogs—Saramâ and Shunâsîrau—Dog (star) commencing the year—Heliacal and acronycal rising of Orion in spring and autumn—Vishnu and Rudra—Kerberos and Orthros—The legend of Namuchi *alias* Vṛitra—His decapitation by Indra at the gates of heaven, where Orthros is stationed—Represented by the "antelope's head" in the heavens, Vṛitra being = Mṛiga—Compact between Indra and Namuchi—Watery foam—Its identification, with the Milky Way—Legends of Rudra—How he killed Prajâpati Yajna or Sacrifice at the begining of the year—Shûlagava sacrifice—Tistrya = *tri-stri*, the three star belt of Orion—The Hindu Trinity, Dattâtreya—His representation in the sky.

THE part of the heavens, which contains the Nakshatras, we have now to consider, is the most attractive and interesting in the celestial sphere. Even a casual observer on a clear night is sure to be attracted by its splendid appearance, and the rising of the sun in this portion of the heavens at the beginning the year must have rendered it doubly attractive to the ancient Aryan observers. It contains no less than five stars of the first magnitude including Sirius and a number of the second, with the stream of the Milky Way passing through them. Here there was a fine field for the virgin imagination of the ancient poets and

priests and the numerous legends that exist in almost all the sections of the Aryan race about this portion of the heavens fully show that they did not fail to make use of this brilliant opportunity. I intend to examine some of these legends in this chapter with a view to see what corroborative evidence we may get therefrom. If we can more naturally and easily explain the legends that relate to this part of the heavens on the present theory, than has hitherto been done, we may fairly conclude that we have rightly interpreted the passages from the Brâhmaṇas; if not, we shall have either to revise our assumption or to give it up entirely. But before we do so we must, as far as possible, try to identify the asterisms and determine their forms as described in the ancient works.

We shall first take up Mṛigashiras or Âgrahâyaṇî according to Amarasinha. The very name of the Nakshatra, which means "an antelope's head," * suggests the figure of the asterism But the constellation consists of so many stars that it is very difficult to say which of them might have suggested the name. I may here remark that the doctrine of "Yogatâràs" or the junction stars cannot be supposed to have been developed in the early days we are here

* I may here, once for all, remark that though I have translated the word *Mṛigashiras* by the "antelope's head," I do not mean to imply that *Mṛiga* necessarily meant "an antelope" in the Vedic literature. It has been suggested that *Mṛiga* may mean "a bullock" or some other animal like it. It may, but we have nothing to do with it, inasmuch as the word *Mṛiga* itself is still used in the Sanskrit literature to denote the constellation. My translation of *Mṛigashirâs* must therefore be considered provisional, remembering that though it may change yet the argument in this chapter will still remain unaltered.

speaking of. I do not mean to say that single stars may not have been or were not specifically named. But whereever a constellation is spoken of, it is more probable that the whole group was intended, as in the case of the Seven Bears or the Krittikâs; and hence the determination of the junction stars, as given in later astronomical works, cannot help us beyond indicating where we are to look for the constellation described in the old works. For instance, if we take Mrigashiras we are told that one of the three small stars in the head of Orîon is the junction star. This means that we must look for *Mrigashiras* in the constellation of Orion. But how can these three stars give us the figure of an antelope's head? The three stars are so close that between themselves they give us no figure at all. It is, however, suggested that the two stars in the shoulders and two in the knees of Orion give us the four feet of the antelope, whose head may then be said to correspond with the three stars in the Orion's head. In short it is the antelope's head in the same way as it is the head of Orion. But besides being open to the objection that this gives us the head and not the *form* of an antelope's head, the explanation presupposes that the whole of the antelope is in the heavens; and if Ârdrâ be correctly identified with the star in the right shoulder of Orion we shall have also to include this star in the four feet of the antelope. The old Vedic works, however, seem to lay down that it was the *head* of the antelope and not the antelope itself, that was transplanted to the heavens. Referring to the legend of Rudra piercing Prajâpati, Sâyana in his commentary on the Shatapatha Brâhmaṇa (ii. 1. 2. 8) * observes that he, the

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*इषुणा तस्य शिरश्चिच्छेद ... इषुः शिरश्चेत्युभयमंतरिक्षमुत्प्लुत्य नक्षत्रात्मनावस्थितं दृश्यते । Sâyana's commentary on Shat. Br. ii. 1. 2. 8.

terrible form created by the gods, "cut off Prajâpati's head by the arrow," and "the arrow and the head both jumped up to the heavens and are there stationed." The Aitareya Brâhmaṇa (iii. 33) gives the same story and there too Pashuman or Bhûtavan is said to have pierced Prajâpati with an arrow. But it does not distinctly say whether it was the head or the body that was pierced by him though in the Shatapatha Brâhmaṇa Mṛigashiras is described as the head of Prajâpati. The tradition of piercing the head does not, however, occur in this form in the Rigveda, though in Rig. x. 61. 5-7 this story of Prajâpati is alluded to. But in many places where Indra is mentioned as killing Vṛitra we are told that he cut off the head of his enemy (i. 52. 10; iv. 18. 9; viii. 6. 7) and in Rig. v. 34. 2 and viii. 93. 14, Indra's enemy is described as appearing in the form of an antelope. This shows that the Rigveda indirectly speaks of an antelope's head having been cut off by Indra, and it may justify us in holding that Rudra did the same. The tradition is preserved even in the Greek mythology which tells us that Apollo, indignant at her sister's affections for Orion, made her hit, with an arrow, a mark in the distant sea, which turned out to be the Orion's head.* In the heavens we must therefore look for the "cut off" head of Mṛiga with the arrow pierced in it. There are other circumstances which point to the conclusion. Sanskrit writers have described a small group of stars in Mṛigashiras called Invakâs. Amarasinha tells us that they are "on the top of Mṛigashiras.† Now if Mṛigashiras

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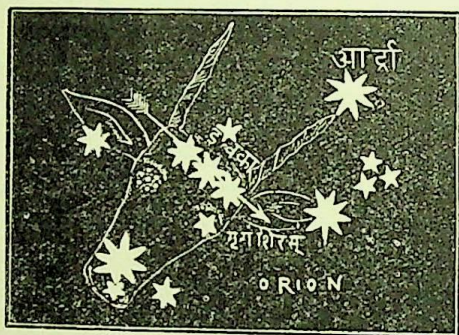
* See Smith's Dictionary of Classical Mythology. Ov. Fast, v. 537.

† Thus:—मृगशीर्षं मृगशिरस्तास्मिन्नेवाग्रहायणी । इन्वकास्तच्छिरोदेशे तारका निवसंति याः । Amara i. 3. 23. तच्छिरोदेशे=मृगशीर्षशिरोदेशे according to BhânuDikshita.

itself be understood to denote the three small stars in the head of Orion, Invakâs become identical with them and the distinction given in Amara must be put aside as meaningless. I am, therefore, of opinion that the asterism of Mṛigashiras was once really believed to possess the *form* of an antelope's head with an arrow sticking to it. The mention of the arrow in these traditions at once enables us to determine the form, for the arrow can be readily and easily identified with the three stars in the belt of Orion. The head with the arrow at the top must therefore be made up by taking along with the belt the two stars in the knees and one in the left shoulder of Orion somewhat as below :—

It gives us the arrow pierced into the head and the three stars in the belt are at the top of the antelope's head—a position which Amara assigns to Invakâs. I may further observe that the ancient observers could not and would not have selected the three small stars in the Orion's head to form their asterism when there were so many stars of the first and second magnitude in the same portion of the heavens. Then again whatever the later astronomers may say about the junction stars in Mṛigashiras, the three stars

of that asterism popularly pointed out, even at present, are those in the belt and not in the head of Orion. I do not mean to imply that the asterism may not have been conceived and figured otherwise. As a matter of fact we know that it was figured as a hunter or a deer, and there are good grounds to hold that these are ancient ideas.* All that I, therefore, mean is that of the various figures we may make out of the stars in the constellation of Orion, *one* should be of an antelope's head with the arrow sticking to it to represent the cut off head of Mṛiga, and not as the present configuration supposes both the body and the head of Mṛiga together and unseparated.

I have in what has gone above presumed that the asterism of Mṛigashiras must be looked for in the constellation of Orion, and that the legends of Rudra and Prajâpati refer to this constellation. Some scholars, however, doubt the correctness of this assumption; and so far as *absolute* certainty is concerned their doubts may be justifiable. For, Vedic hymns were not committed to paper till a long time after they were sung, and there is of course no possibility of finding therein a photograph of the portion of the heavens referred to in the various hymns. All that we can, therefore, do is to weigh the probabilities of the proposed identifications; and if this course be adopted I do not think any reasonable doubts could be entertained about the identification of Mṛigashiras with the constellation of Orion. To quote the words of Prof.

* The constellation appears to have been variously conceived :-- (1) the antelope's head; (2) the whole antelope; (3) Prajâpati either in the form of an antelope or as a person with a belt or *Yajnopavita* (see the next chap.). Of these three forms I consider the "antelope's head" to be the oldest. It will be seen that the three forms are closely connected, and that they are the developments of the same idea.

Whitney "there is the whole story illustrated in the sky: the innocent and the lovely Rohinî (Aldebaran); the infamous Prajâpati (Orion) in full career after her, but laid sprawling by the three-jointed arrow (the belt of Orion), which shot from the hand of the near avenger (Sirius) is even now to be seen sticking in his body. With this tale coming down to us from the first period of Nakshatras in India who could have the least doubt of its persistent identity from the earliest times to the latest ?" * I subscribe to every word of what is here so forcibly expressed. Of course, we may expect some variations of details as the story got degenerated into Purânic legends; but it is impossible to mistake the general identity. I shall therefore not unnecessarily dwell upon it here.

We have seen how Mṛigashiras may have been primitively conceived. After this it is not difficult to identify the other stars. The Rohiṇî is no other than Aldebaran. Rudra is the presiding deity of Ârdrâ, and we may therefore suppose Rudra to be represented by the star in the right shoulder of Orion (*a*). But the Aitareya Brâhmana (iii. 33) identifies Rudra with Sirius or what is now called the Mṛiga-vyâdha. The Milky way does not appear to have received a specific name in these old days, and the three sections of the Aryan race—the Parsis, the Greeks, and the Indians—have no common word to denote the same. Yet it is impossible to suppose that this broad stream of stars could have been unnoticed, and I shall show further on that it was not. Greeek astronomy places two dogs in this part of the heavens—Canis Major and Canis Minor—one on each side of the Milky Way, and it has been doubted whether

* See Prof. Whitney's Essays on Hindu and Chinese systems of asterisms, p. 53.

the claims of these dogs to primitive antiquity are well founded. In what follows, I hope to show that they are. In the meanwhile, I may here refer to the testimony of Plutarch to prove that some, at least, of the actually existing figures of constellations in the heavens are Greek transformations of others which had been placed there before by the Egyptians; for this writer, who in his treatise *De Iside et Osiride* makes the priests of Egypt say that the souls of gods shine in the heavens and are stars, adds that "the constellation of Isis is called, by the Greeks, Canis; that of Horns, Orion, and that of Typhon, Ursa." * This statement is very important, inasmuch as it shows that the names of at least three constellations, Orion, Canis and Ursa, are not of Egyptian or Chaldean origin. Of these Ursa Major (Greek *Arktos*) has been already identified with *sapta ṛikṣhas* or simply the *ṛikṣhas* of the Vedas and the *Haptôiriñga* of the Parsis, thus partly confirming the above-mentioned statement of Plutarch; and it can be shewn, that his observation is equally good in respect of the other two constellations, or that Canis, Orion and Ursa are all of Aryan origin. At present I use Plutarch's statement only so far as to justify us in presuming the three constellations to be of Aryan origin, or, to put it negatively, not borrowed by the Greeks from the Egyptians. †

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* De Iside et Osiride. I take the quotation from Narrien's Origin and Progress of Astronomy, p. 44. Narrien further observes that this assertion of Plutarch seems to be confirmed by the discovery of a sculptured planisphere on the ceiling of the Temple of Denderah where "in the place of Canis Major is traced a cow, the animal consecrated to Isis" and "instead of Orion is the figure of man which is supposed to be intended for the son of Osiris."

† I have deemed it necessary to make these remarks because Mr. Gladstone in his Time and Place of Homer, p. 214, observes that Orion is either "non Hellenic or pre-Hellenic." Plutarch's

Having thus shown that we are at liberty to assume that the Greek legends about Orion and Canis are not of foreign origin, let us see what coincidences we can discover between the legends of the three sections of the Aryan race about this part of the heavens. I am not going to trace every legend to its primitive source and explain it on the dawn or the storm theory. Nor do I believe that it is possible to do so; for there are many other objects in nature besides the dawn and the storm, that are likely to impress the mind of a primitive man;* and a legend, though it might have originated with the sun or the dawn, is sure to grow and develop under the influence of these objects. For instance, we can understand the story of Vṛitra by supposing that he represented the power that locked up the waters in the clouds, but when we are told that this Vṛitra sometimes assumed the form of a Mṛiga, here is a distinct addition which cannot be satisfactorily accounted for on the original theory. Those that have watched and examined how legends grow can easily understand what I mean. The idea that everything must be reduced to "dawn and nothing but the dawn" is the result of supposing that in the days of the Rigveda men were not acquainted with anything else. The supposition is partly true, but as I shall presently show there are many passages in the Rigveda which presuppose the knowledge of stars and constellations. Thus

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testimony shews that the constellation is not of Chaldean or Egyptian origin. The conception must therefore be pre Hellenic, or, in others words, Indo Germanic, and I think I have given ample evidence in this chapter and the next to prove that the idea of Orion was fully developed before the Greeks, the Parsis and the Hindus separated.

* See Herbert Spencer's Sociology, Vol. I., Chap. xxiv.

at the time we are speaking of several ideas had already been formed and recognised and even familiarly known. For example, the idea of *Devayâna* and *Pitṛiyâna* appears to have been well settled at this time, so much so that though the year was afterwards made to commence with the winter solstice, the equinoctial division of the heavens, with all the notions which had already become associated with it, continued to exist, though somewhat restricted in its scope, side by side with the new system. Whether this idea itself is or is not further resolvable into simpler ideas is a different question altogether. Perhaps it may be shown to have grown out of the idea of day and night or light and darkness. There are several passages in the Rigveda (i. 123. 7; 164. 47.) which speak of a black and a white day, and it is very likely that these were the original names of *Devayâna* and *Pitṛiyâna*; for when new ideas are introduced it is usual to express them in old words with such qualifying adjectives as would distinguish the new idea from the old one. A "black day" might thus mean the Dakṣhinâyana or the Pitṛiyâna, as night appeared to increase at the expense of day during the period. When the southern course of the sun thus came to be likened to a dark day or night (Rig. vi. 9. 1) it was naturally regarded as a night of the Devas to distinguish it from the ordinary night; and as no sacrifices were performed during the ordinary night, so no offerings could be made to the Devas during *their* night (vi. 58. 1). Of course, it must have been a long time before men could develop conceptions like these. There was, indeed, a time when they could hardly account for the fact how the sun found his way from the west back to the east. In the Rigveda x. 72. 7, the sun is said to rise from out of the ocean and

a similar idea is found in Homer who describes not only the sun, but even the stars, as "bathed in the waters of the ocean." * In the Rigveda x. 108. 1, Saramâ is said to have crossed really a "long way." The Aitareya Brâhmana iii. 44, which states that the sun never sets in reality, makes a distinct advance upon these notions. But it is difficult to say whether astronomical ideas were developed to such an extent in the days when the year first commenced from the winter solstice. I do not, however, wish to enter here into these details. As previously observed I assume that, at the time we are speaking, the Vedic Aryas had already passed through these stages, and that the ideas of *Devayâna* and *Pitṛiyâna* were familiarly known and established; and assuming these as established, I intend to examine how legends were built upon them. I have, however, briefly alluded to the probable origin of these ideas inasmuch as it helps us to better appreciate the description of the Devayâna and the Pitṛiyâna. Ordinarily the Pitṛiyâna is described (Rig. ix. 113. 8) as the region "where Vaivasvata is the king, which is the undermost (lit. obstructed †) part of the heavens, and where there are eternal waters." The Vaivasvata Yama here spoken of does not, however, appear to have as yet been invested with the terrible character we find given to him in the later literature. Corresponding to Yama in the south we have Indra in the north, each supreme in his own sphere,

* Lewis, Hist. Survey of the Astr. of the Ancients, p. 6. Iliad, v. 6, vii. 422.

† यत्रावरोधनं दिवः in the original. I think अवरोधन means "when the view of the heavens is obstructed;" "the portion of the heavens which is turned away," Cf. Ait. Br. iv. 14, where अवरोधन of the year is spoken of.

and dividing the whole world into two parts, one bright and known, and the other watery and mysterious, or, in the language of seasons, first comprising Vasanta, Grîṣhma and Varṣhâ and the second Sharada, Hemanta and Shishira.

Now when the vernal equinox was in Orion or Mṛigashiras it was the beginning of the Devayâna, and as the constellation is remarkable for its brilliancy and attractiveness the ancient Aryans may have been naturally influenced not merely to connect their old traditions with it, but also to develope them on the same lines. Thus the Devayâna and the Pitṛiyâna, as representing the two hemispheres must be joined, and the vernal and the autumnal equinoxes became the natural points of union between the regions of gods and Yama. The equinoxes were, in fact, the gates of heaven, and as such it was natural to suppose that they were watched by dogs. In the Rigveda i. 48. 15 the dawn is spoken of as illuminating the "gates of heaven," and in i. 13. 6 and ii. 3. 5 the gates-deties are invoked to keep the gates open. We have a similar invocation in the Vâjasaneyi Sanhitâ 21. 49. This shows that the idea of the "gates of heaven" was not unknown in Vedic times and the arrangement of the gates on the sacrificial ground, which is prepared on the model of the annual passage of the sun, shows that these gates divided the whole hemisphere into two parts. Macrobius records a tradition that "the ancients designated the signs of Cancer and Capricorn as the gates of the sun, at which having arrived, the luminary seemed to retrace his path in the zone which he never leaves." * Now Macrobius could not but speak in the language of the twelve zodiacal portions, and if we therefore divest his statement of the form in which it is naturally

* Macrob. Comment. in Somn. Scrip. Lib. I. cap 15. I take the quotation from Narrien's Origin and Progress of Astronomy, p. 51.

expressed it means that the equinoxes, which the ancients supposed to be once in the zodiacal signs named above, were then called gates of heaven.

The Iranians, however, have preserved the legend more fully. With them the equinox is not merely a gate, but a bridge connecting heaven and hell—the Devaloka and the Yamaloka, or the Devayâna and the Pitṛiyâna—and "dogs that keep the Chinvat Bridge" help the departing soul to cross it. Darmesteter, in his introduction to the Vendidad, published in the Sacred Books of the East Series, observes* that "this reminds one at once of the three-headed Kerberos, watching at the doors of hell and still more of the four-eyed dogs of Yama, who guard the ways to the realm of death" (Rig. x. 14.10). The ideas are, indeed, strikingly similar and point out to a common source. Kerberos has even been identified with Sanskrit *Shabala* or *Sharvara*, meaning variegated or a dog of Yama. But, as far as I know, no satisfactory explanation has yet been given of these legends nor any attempt made to explain them on a rational basis.† If we, however, suppose that the vernal equinox was once in Orion, the constellations of Canis Major and Canis Minor—the two dogs—would then be on the boundary line of heaven and Yama's region, and the whole of the above story may be seen illustrated in the sky like that of Prajâpati and Rudra previously referred to.‡ According to Bundahis

* Sacred books of the East, Vol. IV., Zend-Avesta, Part I., introduction v., 4.

† See Kaegi's Rigveda, by Arrowsmith, p. 160, note 274*a*, where the writer quotes Aufrecht to the same effect.

‡ Weber and Zimmer appear to have suggested that the conception of Yama's dogs might have been formed from some constellations. Bloomfield rejects this suggestion and tries to show

xii. 7, the Chinvat Bridge extends from the height of Chakâd-i-Dâitak in the middle of the world to the summit of Arezur at the gate of hell; while Dr. Geiger observes that "it was believed to have been built over a wide expanse of water which separates the paradise from this world."* In the later Indian literature we are told that the souls of the deceased have to cross a stream † before they reach the region of Yama, while the story of Charon shews that even the Greeks entertained a similar belief. What could this river be? With the vernal equinox in Orion, one can easily identify it with the Milky Way, which could then have been appropriately described as separating the regions of gods and Yama, the Devayâna and the Pitṛiyâna, or the Northern and the Southern hemisphere. In the later Hindu works it is actually called the Celestial River (*svarṇadî*), while the Greeks have placed

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that the dogs represent the sun and the moon. His explanation does not, however, show how and why the dogs came to be located at the gates of heaven and why they should be entrusted amongst all the sections of the Aryan race with the duty of watching the souls of the dead. Bloomfield quotes Kath. S. xxxvii. 14 (where day and night are called the dogs of Yama) and Shat. Br. xi. 1. 5. 1. (where the moon is said to be a divine dog) to prove that the dogs must be understood to mean the sun and the moon. But I think that the Brâhmana here gives simply a conjectural explanation, and, as in the case of Namuchi's legend, we cannot accept it, inasmuch as it does not give any reason why the dogs were stationed at the doors of Yama's region. There are many other incidents in the story which are not explained on Bloomfield's theory. I see, therefore, no reason for modifying my views which were put down in writing before I could get Bloomfield's paper in the last number of the Journal of the American Oriental Society.

* Dr. Geiger's Civil. of East Iran., Vol. I., p. 100.

† Called Vaitaraṇî. The Garuḍa Purâṇa, Pretak. vi. 25—31, states that a cow should be given to a Brâhman to enable the deceased to pay the ferrymen on this river.

near it the constellation of Argos (ship) and two dogs—Canis Major and Canis Minor—one on each side to guard both the entrances of the Chinvat Bridge across it. The Rigveda also mentions two dogs of Yama kept to "watch the way." while the Greeks place a three-headed dog at the gates of hell. In Rig. x. 63. 10 we are further told that the land of the blessed is to be reached by "the celestial ship with a good rudder." * The words in the original are *daivîm nâvam.* Comparing these with the expression *divyasya shunah* in the Atharva Veda vi. 80. 3, and seeing that a celestial (*divya*) representation of Rudra is described in later works† it seems to me that we must interpret the epithet to mean "celestial" and not simply "divine." Thus the Vedic works appear to place a celestial *dog* and a celestial *ship* at the entrance of the other world, and these can be easily identified with the Greek constellations of Argo Navis and Canis, if we suppose the Milky Way to be the boundary of Heaven in these days. I do not mean to say that these conceptions had their origin in the appearance of the heavens. On the contrary, a comparison with the non-Aryan legends shows it to be more likely that the heavenly bodies received their names from the pre-existing beliefs, about the other world, amongst the people. Herbert Spencer tells us that amongst the non-Aryan savage races the journey to the next world is believed to lie over land, down a river or across the sea, and that in consequence the practice of burying their dead in boats prevails amongst some of them.‡ The North Americans,

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*See Kaegi's Rigveda, translated by Arrowsmith, p. 159, note 273.

†See the passage from the Mahimna Stotra quoted *infra.*

‡ See Herbert Spencer's Principles of Sociology Vol. 1., chap. xv., 1st Ed.

we are further told, say that the Milky Way is "the 'Path of Spirits,' 'the Road of the Souls,' where they travel to the land beyond the grave, and where their *camp fires* may be seen blazing as brighter stars."* This coincidence between the Aryan and the non-Aryan legends makes it highly probable that the figures of the constellations were conceived by the Aryans according to notions of the next world prevailing amongst them at that time. It may be noticed, however, that the non-Aryan races do not connect the idea of time, *e. g.*, of the year and the seasons, with these beliefs, while it is the *chief* characteristic of the Aryan legends. We are, for instance, told that the dog commenced the year (Rig. i. 161. 13) and that the Devayâna comprised the three seasons of Vasantâ, Grîṣhma and Varṣhâ (Shat. Br. ii. 1. 3. 1).† It is this feature of the Aryan legends that is most important for the purpose of our enquiry, while the coincidence, above pointed out, confirms, in a remarkable way, the genesis of the Aryan legends here proposed. The chief elements in the traditions of the three Aryan nations may thus be satisfactorily explained.

It may, however, be contended that the two dogs of Yama spoken of in the Rigveda may not be the same as the Avesta dogs at the Bridge. A closer examination of the several passages in the Rigveda will, however, dispel such doubts. In the Vendidad xiii. 9, the dogs are called *peshupâna*, or those that guard the way to the region of death. The Avesta dog is *chathru-chashmen* (Ved. viii. 16), while the Vedic dogs are described as *chatur-akṣhau* (Rig. x. 14. 11), both of which expressions mean "four-eyed." The dogs in the Avesta and the Rigveda, however, differ in colour. In Ved. viii. 16 the

* Principles of Sociology, Vol. I., chap. xxiv., p. 399, 1st Ed.
† For German legends, indicating time, see the next chapter.

dogs are said to *zairitem* or *spaetem zairi-gaoshem*, yellow or white with yellow ears ; while the dogs of Yama are said to be *shabalau*, spotted or variegated. But the difference is neither very material, nor such as cannot be accounted for. In the Rigveda we can trace the yellow colour of the Avesta dogs. The antelope of the sun in Rig. x. 86. 3 is said to be *harita* or yellow, the *zairetem* of the Avesta, and if we suppose this antelope to be no other than that represented by Orion, as the sun commenced the year at that point, we need not be surprised if the dogs in the Avesta are described as yellow, especially when in the Atharva Veda viii. 1. 9. we find the two messenger dogs of Yama named as *Shyâma* and *Shabala*, thus noting probably a difference in colour. The Atharva Veda iv. 20. 7 mentions a four-eyed *bitch*, while in the Shatapatha Brâhmaṇa xiii. 1. 2. 9. the adjective is applied to a *dog*; and the same animal is evidently intended in both places. In the Parsi scriptures the dogs at the Chinvat Bridge are sometimes spoken of in singular (Ved. viii. 16) and sometimes, as in Rig. x. 14. 11, in dual (Ved. xiii. 9). This shows that we might disregard gender and number in the description of these dogs ; and we are thus led to suppose that Saramâ in the Rigveda is again to be identified with the dogs that watch the gates of heaven. Whether Saramâ* in primitive days was or was not connected with the dawn, I do not undertake to say. But there is an incident in her story which confirms the identification I have proposed. The Paṇis tried to coax Saramâ by offering her milk which she drank. On her return she denied having seen the cows of Indra, who thereupon kicked her and she vomited the milk. Now the mention of

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* See Max Müller's Lectures on the Science of Language, Vol. II., p. 511.

milk at once suggests the idea that it must be the milk in the galaxy on each side of which the two dogs are stationed. In Rig. iv. 57. 5 Shunâsîrau are invoked in order that they may pour down upon the earth the "milk," which they "make in heaven." Prof. Max Müller records a suggestion that Shunâsîrau, here spoken of, may be a very old name for the Dog-star, and with its derivative *Sairya* would give us the etymon of *Seirios !* * In Rig. vii. 55. 2 the Vâstoṣhpati, "the guardian of the house," in the form of a dog, is invoked and described as bright and red *Sârameya* on whose jaws spears seem to glitter: a description which answers so well with the appearance of Sirius, that with what has been said above we may at once identify the Sârameya with the Dog-star. I may here refer to the Shatapatha Brâhmaṇa ii. 1. 2. 9, where speaking of Mṛigashiras, the Prajâpati's body pierced by Rudra is described at his *vâstu.* May not Vâstoṣhpati be regarded as guardian of this? If so, it may be a further proof that Vâstoṣhpati represents the star Sirius, which, as it were, guards the head of Prajâpati in the form of Orion or the antelope's head. But, apart from this suggestion, I would finally quote Rig. i. 161. 13, where it is expressly stated that "the dog awakened" the Ribhus, the genii of the seasons, at the "end of the year!" Sâyaṇa proposes to interpret *shvânam* in the original by "wind," but it is evidently an error. In the Shatapatha Brâhmaṇa xiii. 5. 1. 8, *vṛika* and *shvâ* are mentioned together, and the former is known to be a name for a wild dog. If so, Sâyaṇa's explanation of Rig. i. 105. 11 appears to be more probable than that of Yâska. It is in fact a description of the dog (star) appearing in the east after

* Max Müller's Lectures on the Science of Language, Vol. II., p. 526.

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crossing "the eternal waters" of Yamaloka, and then being immediately lost in the rays of the sun, which rising after it, had to push the wild dog out of his way. The mention of the "eternal waters" of the Yamaloka indicates that the heliacal rising of the Dog-star, here referred to, occurred at the end of the Pitṛiyâna or at the vernal equinox, thus further confirming the statement that the dog commenced the year. There are other passages of similar import, but as I wish to avoid, for the present, any disputed passages, I do not mention them here. If the time, I am contending to establish for the hymns of the Rigveda, comes to be accepted, it is sure to furnish an unerring clue to the interpretation of many other passages and legends in that sacred book, but the work must be left to be done hereafter.

Putting all these passages together, we find that in the Rigveda, dogs are described as dark and brown, bright and red, possessing four eyes, guarding the house and the way to Yama's region, vomiting and making milk, and above all beginning the new year.* All these facts clearly show that the Vedic dogs are the same as the Hellenic or the Iranian, and we can easily and satisfactorily account

* Prof. Bloomfield's theory leaves many of these facts unexplained. If the dogs represent the sun and the moon, how can the sun tell the Ribhus that the dog awakened them at the end of the year? I cannot also understand how the sun and the moon can be described as variegated in colour, or as engaged in making milk. Again how can the sun or the moon be said to be four-eyed, and why should they perpetually remain at the boundary of heaven and hell? In Rig. x. 86. 4, a dog is said to be let loose at the ear of the Mriga, and this as well as the dog in Rig. i. 161. 13, must be supposed to be different from Yama's dogs, if we accept Bloomfield's view.

for all these legends by supposing that the vernal equinox was near the Dog-star in those days, thus making the dog rise with the sun in the beginning of the year at the gates of the Devayâna. We can now also understand how the dogs could have been described as four-eyed. For, if they are correctly identified with Canis near the Milky Way, then the four stars in the body of Canis might naturally be said to be his eyes; * for once the number of eyes is increased from two to four, we need not expect to find them all on the head, but, like the thousand eyes of Indra in the later mythology, they may be regarded as spread over the whole body. M. Darmesteter rightly observes† that "the Parsis being at a loss to find four-eyed dogs interpreted the name as meaning a dog with two spots above the eyes; but it is clear that the two-spotted dog's services ‡ are only accepted

* In Rig. x. 127. 1, the stars are said to be the eyes of night. The Greeks entertained a similar idea. Their Argos was surnamed Panoptes, "the all seeing," having a hundred eyes on the body. See Max Muller's Science of language, Vol. II., p. 416.

† Sacred Books of the East Series, Vol. IV.; Zend Avesta, Part I.; Intr. v. 4.

‡ These services are required at the funeral ceremony. It may be here noted that the hymn in the Rigveda which describes Yama's dogs (Rig. x. 14) is still recited at the time of burning the dead body of a Hindu. Every Brâhman has also to give, every day, two small offerings of cooked rice to the two dogs of Yama, Shyama and Shabala, at the time of the *Vaishvadeva* sacrifice. The offerings are placed on the ground in the form of a circle, beginning with the eastern point. The offering to Shyama is placed outside the circle at the south-west and that to Shabala at the north-west point. In other words, Shyama and Shabala are placed on each side of the western point, in the same way as the dogs appear in the heavens on each side of the Milky way.

for want of a four-eyed one, or of a white one with yellow ears." Evidently the Parsi priests failed to realise that it was the divine or heavenly, and not an earthly dog that was here described, as driving the death-fiend. The Atharva Veda vi. 80. 3 shows that the Indian priests of the time well understood it to mean a dog who is "born of waters, whose house is in the sky, and who sheds his lustre all around."

There is another set of traditions which we can similarly explain on the supposition with which we have started, *viz.*, that the vernal equinox was then in Orion. The heliacal rising of the constellation at the beginning of the year marked the revival of nature at the commencement of spring, and the asterism may thus be said to represent all these milder influences which in later mythology were fully embodied in the conception of Vishnu. But the case was completely reversed if we take the acronycal rising of the same. It was at the autumnal equinox that the Dog-star rose at the beginning of night, and though, strictly speaking, it marked the end of Varshā, yet the portion of the heaven wherein the constellation is situated could have been easily regarded as the battle-ground of Indra and Vṛitra who fought in those days, and also as the stage on which the terrible Rudra made his appearance. In short, the constellation naturally became the harbinger of the mild and the terrible aspects of nature. It is in this latter sense that the Dog-star might be considered a rain-star, and Saramâ, like the Greek Hermes with which it is identified, might be said to have been sent to search for the cows of Indra taken away by the Paṇis of the nether word. The Greek legends mention two watch dogs—Kerberos and Orthros; and of these

Kerberos has been etymologically identified with *Sharvara* and Orthros with *Vṛitra.** But no explanation has been given of how this Vṛitra came to be stationed at the gates of hell. Prof. Max Müller suggests that Orthros is the dark spirit that is to be fought by the sun in the morning. But then, this does not explain why it was called Vṛitra, and how it came to be killed by Herakles. The legend of Namuchi, as given in the Rigveda and interpreted on the supposition that the year began with the Dog-star, does, however, solve the difficulty. I have already alluded to the fact that in the Rigveda Vṛitra is often said to appear in the form of a *Mṛiga* (Rig. i 80. 7 ; v. 32. 3 ; v. 34. 2 ; viii. 93. 14). In Rig. vii. 19. 5 Vṛitra and Namuchi are both said to be killed by Indra, and though this cannot be taken as a direct authority for holding that Vṛitra and Namuchi are the different forms of the same enemy, yet from the description of the two I do not think there can be any doubt as to their being identical. In fact, Shushṇa, Pipru, Kuyava and Namuchi† are only so many different names of the enemy of Indra. Now Indra is represented as cutting off the head of Vṛitra (Rig. i. 52. 10), and also of Namuchi (Rig. v. 30. 7 ; vi. 20. 6). Combining these statements we get that Indra cut off the head of Vṛitra or Namuchi, in the form of a Mṛiga ; and this at once suggests the question whether that head is not the same as that of Prajâpati cut off by Rudra and which gave the name of Mṛiga-shîrsha, or "the antelope's head" to the constellation. In Rig i 53. 7, we are simply

* Max Müller, Gifford Lectures, 1891, p. 248. Biographies of Words, p. 197.

† See Prof. Bloomfield's contributions to the Interpretation of the Veda in the Journal of the American Oriental Society, Vol. XV., p. 146.

told that Namuchi was killed by Indra in the distant (*parâvati*) region, which seems to mean the region of Yama. But as it does not satisfactorily determine the place where Namuchi was killed, I refer to Rig x. 73. 7, where Indra by killing Namuchi is said to have cleared up 'the paths leading (*yâna* in the original) to the (region of) Devas ;"* which plainly shows that Namuchi was killed at the gates of the Devayâna. In the Vâjasneyi Sanhitâ 10. 14 a sacrificial rite is described which gives the same place and time of Namuchi's death. The priest there throws away a piece of metal hidden under a tiger hide, exclaiming, "the head of Namuchi is thrown away," after he has taken his *Yajamâna* through all directions (East, South, West, North and upwards) and also through all the seasons (Vasanta, Grîṣhma, Sharad, Varṣhâ and Hemanta-and-Shishira). This means, if it can mean anything, that Namuchi *alias* Vṛitra was killed, in the language of seasons, after Shishira, or in other words, at the gate of the Devayâna as described in the above quoted passage from the Rigveda, for the end of Shishira is the end of the Pitṛiyâṇa. Here then we have an explanation of how Orthros came to be at the gate of hell, or in a distant region under the setting sun. But the association of Orthros with Kerberos throws further light on the subject. If Vṛitra's head is the same as Mṛiga-shîrṣha, as explained in the beginning of this chapter, then the three stars in the belt of Orion, which form the top of Mṛigashiras, might have easily suggested the idea of a three-headed monster. In Rig. x. 99. 6

* The original verse is as follows :—

त्वं जघंथ नमुचिं मखस्युं दासं कृण्वान ऋषये विमायं ।
त्वं चकर्थ मनवे स्योनान्पथो देवत्रांजसेव यानान् ॥

Indra is said to have killed a three-headed and six-eyed monster. It might be contended that the explanation is not satisfactory, inasmuch as the head of Mriga is here supposed to be again conceived as a dog, while there is no authority in the Vedic works expressly describing Mriga as a dog. But if Orthros has become a dog in the Greek mythology, while it is a *Mriga* in the Vedas, I see no reason why Kerberos should not get his three heads from the Trishîrṣhan of the Vedas. The difficulty is not at all a serious one. In bringing together the traditions of the three Aryan races after thousands of years, we must make some allowances, and be satisfied with a general similarity of the stories. The asterism of Mrigashiras and the dogs are so close, that one might be easily mistaken for the other, when all the knowledge of the original traditions was lost. It is thus that we can account for the fact that out of the three beings that were represented in this portion of the heavens, Rudra (the hunter) Mriga (the antelope), and Shvâ (the dog), the Greeks retained in the sky only the hunter (Orion), and the dog (*Kuon**, Canis), with nothing to hunt, while the Hindus have not only forgotten, but condemned, the dog.

The Parsis, it is true, have not mistaken the dog, but still as regards complexion, they have represented their dogs as possessing the colour which in the Rigveda is given to

*The principal star in Canis Minor is still called Procyon = Gk. *Prokuon*, Sk. *Prashvan*, the Foredog. It shews that the previous star was once called *Kuon* by the Greeks. If we count the Nakshatras in the direction of the sun's annual course, *Kuon* comes first, and *Prokuon* afterwards. Cf. Sanskrit *Râdhâ* and *Anurâdhâ*, of which, like *Procyon*, later writers have only retained *Anurâdhâ*. *Phalgunî*, *Ashâdhâ*, and *Bhâdrapadâ* are similarly divided into *Pûrvâ* and *Uttarâ*, the preceding and the foregoing.

the antelope of the sun. Another objection that may be urged against this identification is that we are required to suppose Mrigashiras to be once the head of Prajâpati, and at another time that of Vritra. It must, however, be remembered that we do so on the express authority of the Rigveda, and that besides it is quite natural to suppose that once the antelope's head was said to exist in the heavens, Vedic poets vied with each other in weaving legends out of it. As an illustration I refer to Rig. x. 86. 5, where the poet describes Vrishâkapi's head as cut off, but soon after Vrishakapi is told that it was an illusion, and that in reality it was some one else whose head was so severed (verse 18). This clearly shows that it was a period when legends were still being formed out of the "antelope's head."

We can now explain how later writers evolved a myth out of Namuchi's death. The story is given in the Tândya Brâhmaṇa (xii. 6. 8).* There we are told that Indra and Namuchi came to a settlement that the former should kill the latter, neither during day nor by night, nor by any weapon, whether dry or wet. Indra therefore killed him with the foam of the waters at the junction of day and night, when it had dawned, but yet the sun had not risen. It is probably this circumstance that has led Professor Max Müller to suppose that Orthros represents the gloom of the morning. But the explanation does not account for the other

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*See also Taitt Br. i. 7. 1. 7; Shat. Br. xii. 7. 3. 3. Also the Purâṇas, Ramâyaṇa iii. 30. 28; Mahâbhârata Udyoga p. ix. 29. Prof. Bloomfield has collected all such passages in his article on the contributions to the Interpretation of the Veda in the Journal of American Oriental Society, Vol. XV., pp 148 158.—The legend of Hiraṇya Kashipu in the Purâṇas appears to have been based on Namuchi's story.

incidents in the story. Was Namuchi or Vṛitra killed every morning by Indra? Or was it only at the beginning of the rainy season? Evidently the latter. We must then suppose that Namuchi was killed after dawn, but before the actual daybreak, *at* or *during* the monsoons. In other words, the junction of day and night in the later myths must be understood to mean a particular junction of day and night in the rains, or more definitely, the junction of the day and the night of the Gods—the junction of the Pitṛiyâna and the Devayâna, the gates of which are said to be cleared up by Namuchi's death in the passage from the Rigveda given above. The latter part of the legend is, however, still more poetical, and Prof. Max Müller's theory leaves it entirely unexplained. Indra is here said to have killed Namuchi with a weapon which was neither dry nor moist—the watery froth. This is evidently based upon Rig. viii. 14. 13, where Indra is described as "cutting the head of Namuchi with the foam of waters," and the same incident is again referred to in Rig. x. 61. 8. Therefore, even if we reject later speculations with respect to "why foam or froth should have been used," and decline to solve the question by assuming a compact* between Indra and Namuchi, yet we have to account for the fact that in the Rigveda itself Indra is said to have used the foamy weapon to destroy his enemy. What could this foamy weapon be? If Namuchi was killed at the

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* Prof. Bloomfield has discussed this legend in a recent number of the Journal of the American Oriental Society (Vol. XV., Number II.), but he gives no explanation of the compact between Indra and Namuchi. In my opinion it is impossible to hold that the compact could have been the original basis of the legend. It is evidently a later invention to explain what were then deemed otherwise inexplicable incidents in the legend; and until these incidents are explained in a natural way, the legend cannot be said to be properly understood.

gates of the Devayâna and his head still lies there, the watery foam could be no other than the broad belt of the Milky Way which crossed the heavens at the same part. The blue vault of the heavens is often compared to an ocean in the later Sanskrit literature,* and the stars are said to be the patches of foam upon its surface. Thus in the Mahimna Stotra, which is considered to be at least seven or eight hundred years old, the author describes (verse 17) the heavenly form of Rudra (*i. e.*, Rudra as represented in the sky), and tells us that the stream of waters on his head has "the beauty of its foamy appearance enhanced by a number of stars."† This is a description of the Ganges on the head of the celestial form of Shiva, and the author of Mahimna, who, in verse 22, refers to the story of Rudra piercing Prajâpati with an arrow, and says that the whole story is still illustrated in the sky,‡ evidently meant to

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*Cf. Sâhitya Darpaṇa 10, where under अपह्नुति we have—

नेदं नभोमण्डलमंबुराशिर्नैताश्च तारा नवफेनभंगाः ।

† वियद्व्यापी तारागणगुणितफेनोद्गमरुचिः
प्रवाहो वारां यः पृषतलघु दृष्टः शिरसि ते ।
जगद्द्वीपाकारं जलधिवलयं तेन कृत-
मित्यनेनैवोन्नेयं धृतमहिम दिव्यं तव वपुः ॥

The conception of Shiva embodied in this verse is really a grand one. The poet asks his readers to imagine how great must Shiva be, the celestial stream on whose head encircles the Universe! The Milky Way which girdles the celestial sphere cannot be better described.

‡ प्रजानाथं नाथ प्रसभमभिकं स्वां दुहितरं
गतं रोहिद्भूतां रिरमयिषुमृष्यस्य वपुषा ।
धनुष्पाणेर्यातं दिवमपि सपत्राकृतममुं
त्रसंतं तेऽद्यापि त्यजति न मृगव्याधरभसः ॥

Also Cf. Shâkuntalâ, i., मृगानुसारिणं साक्षात्पश्यामीव पिनाकिनम् ।

describe by it the Milky Way which passes over the head of the star of Rudra. Now if the poetic imagination of the author of Mahimna can perceive foam in the Milky Way, I see no reason why the virgin imagination of the Vedic poets should not rise to that pitch. Dr. Haug, speaking of the Vanant Yastha, observes that the constellation (Vanant), by which the Parsi Dasturs understand the Milky Way is said to stand directly over Hell, and further, "the Dasturs are of opinion that this constellation is the weapon (*Vazra*) which is constantly aimed by Mithra at the head of the Daevas, as stated in the Khurshed Yasht."* Referring to the Khurshed Yashta we simply find that the club (*Vazra*) of Mithra "was well struck down upon the skulls of the Daevas."† The information given to Dr. Haug may therefore be traditional among the Parsi Priests; but whether traditional or otherwsie as it comes from an independent source, it is strong corroborative evidence to support the identification of Indra's foamy weapon, with the stream of the Milky Way in the heavens. With the vernal equinox near the Dog-star, the Milky Way, which then separated the region of gods from that of Yama, could well be said to be over Hell and "well struck upon the heads of the Daevas." Namuchi's legend can thus be simply and naturally accounted for, if we assign to the equinoxes the position which we have deduced from other passages in the Vedic works. I may point out that we do not hereby account for the original idea of Vṛitra. That is evidently a still older legend. But his existence at the gate of Hell and his decapitation by the foamy weapon—the two chief elements in the later Vedic traditions are satisfactorily

*Dr. Haug's Essays on the Parsis p. 271, Note.

† Sacred Books of the East Series, Vol. XXIII. Zend Avesta, Part II., p. 87.

explained by placing, as originally proposed, the vernal equinox in the constellation of Orion, and identifying Namuchi *alias* Vṛitra with the constellation of Mṛigashiras or the antelope's head, situated just below the Milky Way.

We have next to deal with the legends of the bold hunter, the terrible Rudra chasing the antelope. Several attributes in the Purâṇic mythology, *e. g*, his bearing the Ganges, in his matted hair, his fondness for the burning ground, and his appearance as Kirâta or hunter, are all accounted for by placing Rudra just below the Milky Way or the celestial Ganges,* at the gates of the Pitṛi-yâna and figured as a hunter. I have already alluded to the difficulty of identifying Rudra. But whether we take the star of Ârdrâ or Sirius to represent the lord of cattle, the above attributes remain the same. But neither these legends, nor the story of Rudra chasing Prajâpati, which, so far as it was necessary for our present purpose, has been already given, can help us, in a material degree, to solve the question under consideration. I wish, therefore, to deal here only with such traditions as point out to the position of Rudra in the course of the year. Rudra, as the lord of the cattle and the presiding deity of storms, can be at once recognized and placed in the rainy season. There are, however, other legends indicating time more definitely. In Rig. x. 192. 2, *Saṁvatsara* or the year is said to rise out of the ocean, the place where Vṛitra was killed (Rig. x. 68. 12). Prajâpati, as represented by Orion, may also be naturally supposed to commence the year when the vernal equinox was in Orion. Rudra killed Prajâpati, and as I have shown before, Prajâpati, *Saṁvatsara* and *Yajna*

* See Mahimna Stotra, verse 17, quoted *supra.*

were convertible terms. Rudra therefore killed Prajâpati or *Yajna* at the beginning of the year; and *Yajna* also meant sacrifice. Rudra was therefore naturally believed to have killed the sacrifice—thus giving rise to the Purâṇic legends of Rudra routing the sacrifice of Dakṣha. At the end of the Sauptika Parva in the Mahâbhârata* we are told that "Rudra pierced the heart of *Yajna* or Sacrifice with an arrow. Thus pierced the Sacrifice, with fire, fled away in the form of an antelope and having reached the sky, there shines in that form, followed by Rudra." Thus it was that Rudra acquired the title of Sacrifice-breaker. In the Tâṇḍya Brâhmaṇa vii.2.1, the death of Prajâpati is, however, spoken of as voluntary. In Taitt. Br. iii. 9. 22. 1, he is said to have assumed the form of *Yajna* and given himself up to the Devas to be sacrificed. The Devas killed him on *their* morning, and so every one should similarly perform the *Ashvamedha* sacrifice at the beginning of the year. One can now understand what the meaning of these stories is. They refer to the death of Prajâpati by Rudra at the *beginning of the year;* and thus it was that *Yajna* meaning the year was sacrificed by means of *Yajna* or Prajâpati. Rig. x.90. 16., where we are told that Gods sacrificed *Yajna* by *Yajna*, but this (human sacrifice) was an old (out of date) practice, may also be similarly interpreted. I cannot say which of

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* Mahâ. Saupt. 18, 19. 14 :—

ततः स यज्ञं विव्याध रौद्रेण हृदि पत्रिणा ।
अपक्रांतस्ततो यज्ञो मृगो भूत्वा सपावकः ॥
स तु तेनैव रूपेण दिवं प्राप्य व्यराजत ।
अन्वीयमानो रुद्रेण युधिष्ठिर नभस्तले ॥

Here the antelope is said to be pierced in *the heart* and not in the *head* as in the Vedic works. It appears, therefore, that the *whole* antelope was considered to be in the heavens at this time.

these legends is older, whether that of Prajâpati sacrificing himself, or of Rudra killing him at the beginning of the year. But whichever of these be the older one it does not affect our present question. Both of them indicate that Prajâpati once commenced the year and that he either willingly allowed himself to be sacrificed or was killed by Rudra at that time. As another indication of time, I may point out that the time, prescribed for the sacrifice of Shûlagava in Âshvalâyana Gṛihya Sûtras, 4. 9. 2, is in Vasanta or Sharad with the asterism of Ârdrâ. The passage, as now understood, means that the sacrifice should be performed on any day in Vasanta or Sharad when the moon—whether full, half, quarter or new—is near the asterism of Ârdrâ, the star over which Rudra presides. But it appears to me that here we have a tradition that the sacrifice was originally required to be performed at the new or full moon in the vicinity of Ârdrâ, in Vasanta or Sharad, thus indicating that the vernal equinox was near Ârdrâ when the sacrifice was orginally established. When the seasons receded Ârdrâ new or full moon could not fall in Vasanta or Sharad and therefore Ârdrâ night afterwards came to mean *any* night when the moon is near the asterism of Ârdrâ in Vasanta or Sharad. However, as the point is not quite satistactory I shall not press it here. The only other fact about Rudra worthy of notice is that he seems to be described as followed by dogs or rather as their master (Vaj. San, 16. 27).* This may shew that the Vedic poets knew of the dogs near the star of Rudra.

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* In the original there are salutations to several forms of the deity, but it would not be quite safe to infer from it that Rudra was, as a matter of certainty, followed by dogs. In Tand. Br. xiv. 9, 12, Shiva is described as *Mrigayu*, while the passage in Vaj. San. (16. 27) says श्वभ्यो मृगायुभ्यश्च...नमः ।

I have already alluded to the Parsi legends of the Chinvat Bridge and the dogs that keep it. There is, however, one more circumstance to which I wish here to refer. The star Tistrya has been identified with Sirius and the identification, if not absolutely correct, is at least sufficiently so for general purposes. But I think that the word itself has not been yet satisfactorily explained. I propose to derive Tistrya from *Tṛi-stṛi* which in Sanscrit means three-stars. Tṛi-stṛi may easily be corrupted into Tistri, Tister. Tister is, therefore, the same as Kerberos or trishiras and the fact that Tistrya is called Tîr or arrow in Modern Persian further confirms this derivation, for the Aitareya Brâhmaṇa (iii. 33) calls it the three-starred or tripartite arrow of Rudra in the sky. I have in the last chapter shown that if we commence with the summer solstice and regard Fravashinam as the first month of the year, Tistreye corresponds to Mârgashirṣha. If Tister is understood etymologically to mean the belt of Orion this coincidence of the months can be better accounted for. I am therefore of opinion that Tistrya should not be identified with Sirius, but with the belt of Orion. We can then better understand why the star should have been spoken of as *Tristryeni* * probably indicating more stars than one and also *Pauryeni*, the first. The Parsis have preserved

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* As the word is understood at present it means "pertaining to or belonging to Tristrya." But grammatically it may mean "many stars or group of stars." I may here point out that if we identify Tistrya with Sirus the etymology is not explained, nor can we account for the modern Persian name *Tîr* which again means an arrow. While if we identify Tristrya with the three stars in the belt everything is satisfactorily acconnted for. All the arguments based upon the "rain producing" infiuence of the star are equally applicable in either case, since both the stars (Sirius and Orion) rise at the same time. See Dr, Geiger's Civil of East Iran., Vol I., pp. 141-142.

another interesting relic of the asterism of Mṛigashiras, but I reserve it for the next chapter.

Starting with the supposition that the vernal equinox was in Orion, we have thus an easy and a simple explanation by which the three principal deities in the Hindu mythology can be traced to and located in this part of heavens. Vishṇu representing the happy times of Vasanta, Rudra presiding over storms and Prajâpati, the deity of sacrifices beginning the year, were all combined in one place. It was here that Vishṇu killed Vâràha (Rig. i. 61. 7) ; it was here that Indra killed Vṛitra, and it was here that Rudra chased Prajâpati, in the form of Yajna or that he sacrificed himself. The celestial Ganges separating the upper and the neither world was also in the same quarters, and through it lay the path to Yama's region. In a word the Trinity of the Hindu Pantheon was fully represented in the constellation of Orion, when the vernal equinox was there. Later writers describe this trinity as represented by the three-headed Dattâtreya, followed by the Vedas in the form of dogs ; and after what has been said above, I think we can have no difficulty in identifying this personified Trinity with Orion having three stars in the head and closely followed by the dog (Canis) at its foot. It will be difficult to find another place in the heavens where all these elements are combined in such an interesting manner.

CHAPTER VI.

ORION AND HIS BELT.

Agrahâyana = *Âgrayana* in the older works—Probable derivation of *hâyana*—The *Âgrayana* sacrifices—Their number and nature—Performed every half-year in Vasanta and Sharad—Greek legends of Orion—Their similarity to Vedic legends—German traditions and festivities—Stag and hind—Twelve nights—Dog-days—All of which indicate the commencement of the year in Orion—Dr. Kuhn's explanation is insufficient—The usual adjuncts of Orion—His belt, staff and lion's skin—The *aiv-yaonghana* of Haoma in the Avesta—The *yajnopavîta* of the Brâhmans—Their sacred character probably borrowed from the belt of Orion or Yajna—Use of *mekhalâ*, *ajina* and *danda* in the Upanayana ceremony—Probably in imitation of the costume of Orion or Prajâpati, the first of the Brâhmans—Derivation of Orion from *Âgrayana*—Its probability—Phonetic difficulties—Conclusion.

In the last chapter I have quoted an observation of Plutarch that the Greeks gave their own name to the constellation of Orion, and have there discussed some Vedic legends which corroborate Plutarch's remarks and indicate that the vernal equinox was in Orion at that time. In the present chapter I mean to examine other legends which go to shew that the constellation of Orion was known and figured before the Greeks, the Parsis, and the Indians separated from their common home, and that the legends or the traditions so preserved, and perhaps the name of the constellation, can be naturally and easily explained only on the supposition that the vernal equinox was then near the asterism of Mrigashiras.

I have already shown that *Âgrahâyṇi* if not *Agrahâyaṇa*, can be traced back to Pâṇini's time, as the name of a Nakshatra, and that it is a mistake to derive it from the name of the full-moon day. We have now to see if we can

trace back the word still further. The word *hâyana* does not occur in the Rigveda, and it may be doubted if the name *Âgrahâyaṇî* was in use in the old Vedic days. *Hâyana* is, however, used in the Atharva Veda (viii. 2. 21 ; xi. 6. 17) and in the Brâhmaṇas ; and may be compared with Zend *Zayanô* meaning winter. Pâṇini (iii. 1. 148) derives *hâyana* from *hâ*=to go or abandon, after the analogy of *gâyana* and gives two meanings, *viz*, the grain '*vrîhi*' and 'time.' Whether we accept this derivation or not, it is at any rate clear that the word was used in Pâṇini's days, to denote a division of time and a kind of grain, and I think we can better account for both these meanings of *hâyana* by connecting the word with *ayana* and *Âgrayaṇa* or the half-yearly sacrifices. Dr. Geiger, speaking of the old Parsi calendar observes that "probably the half-year was more employed in civil life than the complete year." * Now whether the observation be entirely correct or not, we can, I think at any rate, assume that the division of the year into two equal halves is an old one. I have already discussed the two-fold division of the year into *Devayâna* and *Pitṛiyâna* and its coincidence with the passage of the sun to the north and the south of the equator. *Ayana* in the sense of such a division thus appears to be an old word and by prefixing *h* to it we may easily get *hayana* subsequently changed into *hâyana* like the words in the Prajnâdî list, wherein this word was not included as it was derived by Pâṇini in a different way. The insertion and omission of *h* when

* Dr. Geiger's Civ. East, Iran., Vol. I., p. 152. Dr. Schrader makes a similar observation. "For all these reasons (most of which are philological) I believe we have the right to presuppose an original division of the Indo Germanic year into two seasons." Preh Ant. Ary. Peoples, Part IV., chap. vi., p. 302.

followed by a vowel at the beginning of a word is not uncommon even in these days,* and there is nothing extraordinary if we derive *hâyana* from *ayana*. Now by a natural process when we have two forms of a word or two derivatives of the same root they gradually come to be utilised for specific purposes, and so acquire distinct meanings. Sanskrit lexicographers class such words under *Yogarûḍha*, meaning thereby that etymology and convention have each a share in determining their denotation. *Hayana* might thus come to exclusively denote a complete year, while *ayana* continued to denote a half-year as as before.† When *ayana* thus became *hayana*, *Âgrayaṇa*, which all lexicologists derive from *agra+ayana*, ‡ would be changed into *agra+hayana=Âgrahayaṇa* ; and when *hayana* was changed to *hâyana* in a manner analogous to the words in the Prajnâdi list (Pan. v. 4. 38) as stated above, *Âgrahayaṇa* would be altered into *Âgrahayâṇa*. We can thus account for the double forms—*hayana* and *hâyana*, *Âgrahayaṇa* and *Âgrahâyaṇa*—which we find given in Böhtlingk and Roth's and other lexicons. while if we accept Pâṇini's derivation,

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* Cf. The derivation of the word 'history' from 'istory' in Max Müller's Lectures on the Science of Language, Vol. II., p. 329.

† Zend *Zayanô*, denoting winter, probably preserves an older meaning, when *hâyana* was used to denote the second of the two seasons (summer and winter) into which Dr. Schrader believes that the year was primevally divided. Some of the synonyms for the year in Sanskrit originally denoted particular season, *e. g.*, *Varshâ*, *Sharad*. *Samâ* and *Hâyana* may be similarly supposed to have been derived from the names of the half-year or *ayana*.

‡ This derivation would give us *Agrâyaṇa* instead of *Âgrayaṇa* and native grammarians obtain the second form from the first by the interchange of the initial vowel with the following long *a*.

hayana will have to be either thrown out as incorrect or derived otherwise. In Amara ii. 8. 52, *hayana* occurs as a different reading for *ḍayana* in the sense of a vehicle and Bhânu Dikṣhita derives it from *hay* to go; but we might as well ask if *hay*, *ay*, and *i*, all meaning to go, are not the different forms of the same root. As far as the *form* of the word is concerned we may therefore derive *hâyana* from *hayana* and the latter again from *ayana* and similarly *Âgrahâyaṇa* from *Âgrahayaṇa* and this again from *Âgrayaṇa*

I may, however, remark that the process which appears so simple according to the modern philological rules, was not recognized by the native grammarians. There are good many words in Sanskrit which can be thus easily derived on the principle of the insertion and omission of *h*. Thus we have *invakâ* and *hinvakâ* both meaning the stars on the top of Mṛigashiras, and *aṭṭa* and *haṭṭa* denoting a marketplace. But native grammarians, including Pâṇini, would not derive the words from each other, as we have done above in the case of *ayana* and *hayana*. Their method is to give two different roots for the two words, thus we have two Vedic roots *hinva* and *inva* or *hiv* and *iv*, both meaning to go, to please, the one giving us *hinvakâ* and the other *învakâ*. *Aṭ* and *haṭ*, *an* and *han*, *ay* and *hay*, *i* and *hi* are further instances of the principle adopted by the native grammarians in such cases. Really speaking this is not solving the difficulty, but only shifting it a stage backwards; for if any explanation is necessary to account for the double forms like *ayana* and *hayana*, it is equally required to explain why we should have the double roots like *ay* and *hay*, both meaning to go. But it appears that the native grammarians, having traced

the words to their roots, did not push the matter further. With them *ina* is derived from *i* to go, *ayana* from *ay* to go, *hayana* from *hay* to go, and *hâyana* from *hâ* to go.* Whether and how far we can dispense with some of these roots is an important philological question, but it is not necessary for us to discuss it here. It does not much affect the point under discussion whether *hâyana* is derived from *ayana*, *i. e.*, *ay* to go, or from *hâ* to go as Pâṇini has done. Etymologically both the words, *ayana* and *hâyana*, mean "going" and when both came to be used to denote a division of time, it is natural to suppose that they soon acquired special meanings. Thus while *ayana* continued to denote the half year; *hâyana*, which was comparatively a later word, might have been exclusively used to denote the complete year, and as the beginning of the first *ayana* was also the beginning of the year, *Â(a)grayaṇa* would be naturally changed into *Â(a)grahâ(a)yaṇa* to express the beginning of the year. Whether we adopt Pâṇini's derivation or the principle of modern philology we thus arrive at the same result, and so far as our present inquiry is concerned we can therefore suppose that the various words, which may be represented by *Â (a)gra(â)yana*, or *Â(a)grahâ(a)yaṇa*, are all transformations or derivations of *agra* + *ayana* = *Â(a)grayaṇa*.

* This method sometimes fails, and native grammarians who are not now at liberty to coin new roots, have to resort to the Pṛishodarâdi list. For example, we have two forms *ilvalâ* and *hilvalâ* as different readings for *invakâ* in Amara i. 3. 23. Of these *ilvalâ* can be derived from *il*, to sleep, though the root meaning is not suitable, but *hilvalâ* cannot be even so derived and Târânâthâ in his Vâchaspatya would derive or rather obtain the initial *h* by Pṛishodarâdi. Similarly cf. *Hintâla* = *tâla* + Pṛishodarâdi !

Now as regards the meaning it appears to me that *ayana* at first denoted nothing more than the passage of the sun. Gradually it meant a division of time regulated by such passage. The *Âgrayâṇa-ishṭis* thus appear to have originally meant the two half-yearly sacrifices performed on the first day of each *ayana*, which seems to be regarded somewhat like the new year's day at present. Gârgya Nârâyaṇa, in his commentary on Âshvalâyana's Shrauta Sûtras (i. 2. 9. 1.) derives *Âgrayana* from *agra + ayana*; but interprets it to mean a sacrifice which is followed by eating (*ayana*,) that is, which requires to be performed before the new harvest is used for domestic purposes. He thus takes *ayana* to mean eating, and as the *Âgrayaneshṭis* in later works like Manu (iv. 27) were described as "New-harvest sacrifices," all commentators have adopted this explanation of the word. But it appears to me to be evidently of latter origin and invented to account for the nature of the sacrifice when owing to the falling back of seasons the *Âgrayaṇeshṭis* came to be performed not at the beginning of each *ayana* as they should have been, but at wrong times. The necessity of such an explanation must have been still more keenly felt, when instead of two half-yearly sacrifices, the *Âgrayaṇaishṭis* were performed thrice a year. Âshvalâyana, it is true, gives only two, one in Vasanta and the other in Sharad, the old beginnings of the Devayâna and the Pitṛiyâna and the real commencement of the two *ayanas* But he has mentioned three kinds of grain that may be used, *vrîhi*, *shyâmâka* and *yava* (i. 2. 9. 1,) and his commentator Gârgya Nârâyaṇa observes that *yava* and *shyâmâka* are to be used simultaneously in Sharad (i.2. 9. 13). It appears, however, that the fact, that three kinds of grain were sanctioned for use, soon gave rise to three

Âgrayaṇa-ishtis—one in Vasanta with *vrîhi*; the second in Varshâ with *shyâmâka*, and the third in Sharad with *yava*. But that it is a practice of later origin is evident from a passage in the Taittirîya Sanhitâ (v. 1. 7. 3) which states that "twice is grain cooked for the year," clearly meaning thereby that there were only *two Âgrayaṇa-ishṭis* in a year when the new harvest was first offered to gods. I am therefore of opinion that originally there were only *two* half-yearly sacrifices at the commencement of each *ayana*, and as *vrîhi* was used, on the occasion of the first of these *ishṭis*, the word ayana or *hâyana* naturally came to denote the grain so used, and that *ayana* in *Âgrayaṇa* originally meant not eating as the later writers have imagined, but a half-year as the word usually denotes. This way of deriving and explaining the word is not a new invention. For notwithstanding the fact that *Âgrayaṇa* and *Âgrahâyaṇa* are explained by Târânâtha as referring to the sacrifice of grain and eating, yet he derives *Âgrayaṇa*, a word of the same group, from *agra+ayana* and explains it to mean that "the Uttarâyaṇa was in its front."* Even native scholars thus appear to be aware of the fact that *Âgrayaṇa* could be or was derived from *ayana* meaning the Uttarâyaṇa. Indeed, we cannot otherwise account why the *Âgrayaṇeshṭis* were originally celebrated at the beginning of Vasanta and the end of Varshâ as stated by Âshvalâyana. The *Âgrahâyaṇî* of Amara is thus traceable to *Âgrayaṇî* of the Vedic works; and perhaps it was the initial long vowel in the latter that might have been retained in the later form.

It may, however, be asked if there is any evidence to show that *Âgrayaṇa* was used to denote a star in the Vedic

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* See Vâchaspatya s. v. *Agrayaṇa*.

works. That Amara, and long before him Pâṇini, understood *Agrahâyaṇî*, if not *Âgrahâyaṇa*, to mean the Nakshatra of Mṛigashiras is undoubted ; and I think we might fairly infer therefrom that the meaning given by these writers must have come down to them traditionally. Every *ayana* must begin with some Nakshatra, and it is quite natural to suppose that *Âgrayaṇa* must have gradually come to denote the star that rose with the first *ayana*. But I have not been able to find out a passage where *Âgrayaṇa* is used in the Vedic works to expressly denote the constellation of Mṛigashiras. I may, however, refer to the Taittirîya Sanhitâ (vi. 4. 11. 1.) wherein the vessels (*grahas*) used for sacrificial purposes are mentioned as beginning with *Âgrayaṇa* and considering the fact that two other vessels are named, as the words themselves denote, after the planets Shukra and Manthin,* we might suppose that *Âgrayaṇa* came to be included in the list, not as the name of a deity, for it was not such a name, but as denoting, the star which commenced the year, or the half-year. The word *graha* which in the sacrificial literature denotes vessel has been used in later astronomical works to denote the planets, the number of which, including the sun and the moon, is fixed at nine, the same as the number of the vessels used for sacrificial purposes. It is not, therefore, improbable that *Âgrahâyaṇî* or *Âgrahâyaṇa* of the later writers was a transformation of *Âgrayaṇa*, and that Mṛigashiras, was so called in *old times for sacrificial purposes*. When the *Âgrayaṇeshṭis* lost their primary meaning, *Âgrayaṇa* or *Âgrahâ-*

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* See *infra* Chap. VII. In Taitt. San. iii. 1. 6. 3 the vessel is described as the vessel *of Âgrayana*, thus shewing that the vessel was named after *Âgrayana*, which must therefore be either the name of a deity or of a Nakshatra.

yaṇa naturally came to to be used more to denote the month when the sacrifice was performed than the Nakshatra at the beginning of the *âyana*, thus giving rise to the speculations previously discussed. But in whatever way we may explain the disappearance of *Āgrayaṇa* in the sense of Mṛigashiras in the oldest Vedic works, the fact that in the days of Amara and long before him of Pâṇini *Agrahâyaṇî* was used to denote the constellation of Orion remains unshaken, and we may safely infer therefrom that the meaning given by them was a traditional one.

We have already seen how legends gathered round the "antelope's head." It was the head of Prajâpati wishing to violate his daughter, by which some understood the dawn, some the sky and some the star Aldebaran (Ait. Br. iii 33). Others built the story of Namuchi upon the same which placed Vṛitra, at the doors of hell; while a third class of legend-makers considered that the death of Prajâpati was voluntary for the sacrificial purposes of the Devas. The following summary of the classical traditions about the death of Orion, taken from Dr. Smith's smaller Classical Dictionary, will show how strikingly similar they are to the old Vedic legends.

"The cause of Orion's death is related variously. "According to some, Orion was carried off by Eos (Aurora), "who had fallen in love with him; but as this was dis- "pleasing to the gods, Artemis killed him with an arrow "in Ortygia.* According to others, he was beloved by "Artemis and Apollo † indignant at his sister's affection "for him, asserted that she was unable to hit with her

* Homer Od. v. 121. 4. See Gladstone's Time and Place of Homer, p. 214.

† Ov. Fast v. 537.

"arrow a distant point which he showed her in the sea. "She thereupon took aim, the arrow hit its mark, but the "mark was the head of Orion, who was swimming in the "sea. A third account, which Horace follows, states that he "offered violence to Artemis, and was killed by the god-"dess with one of her arrows."

Thus love, arrow and decapitation which are the three principal elements in the Vedic legends, are all present in these traditions. There is another story which says that Orion was stung to death by a scorpion; but this is evidently intended to represent the fact that the constellation of Orion sets when that of Scorpion rises in the east, and is therefore of later origin when the zodiacal signs were adopted by the Greeks.

There are other traditions which point out the position of Orion in the course of the year. The cosmical setting of the constellation was believed to be an indication of stormy weather and the constellation was called *imbrifer* or *acquosus* in the same way as the *Shvâ* in the Vedas is said to commence the year, while Shunasîrau are invoked along with Parjanya for rain. The German traditions are, however, more specific, and I take the following abstract of the same by Prof. Kuhn communicated to the late Dr. Râjendralâl Mitra and published by the latter in his "Indo-Aryans," Vol. II., pp. 300–302 :—

"Both in our ancient and modern popular traditions, there is universally spoken of the Wild Hunter, who sometimes appears under the name of Wodan or Goden, and was, in heathenish times, the supreme god of the ancient German nations. This god coincides, both in character and shape with the ancient Rudra of the Vedas (*vide* p. 99).

Now there is a class of traditions in which this ancient God is said to hunt a stag and shoot at it, just as Rudra in the Brâhmaṇas is represented as shooting at the *ṛishya* and *rohit.* The stag in German mythology, is the animal of the god Freyr, who, like Prajâpati, is a god of the sun, of fertility, &c., so that the shot at that stag is to be compared with Rudra's shooting at the *ṛishya* = Prajâpati. I have further endeavoured to show that some indications exist in the mediæval penitentials of Germany and England, which give us to understand that at the close of the old year and at the beginning of the new one (we call that time " die-zwölften" or *the twelve days, dvâdashâha* of the Indians) there were mummeries performed by the country people, in which two persons seem to have been the principal performers, the one of whom was disguised as a stag while the other was disguised as a hind. Both represented a scene, which must have greatly interested and amused the people, but very much offended the clergy, by its sordid and hideous character; and from all the indications which are given in the text, communicated by me (pp 108-180), we may safely suppose that the chief contents of this representation was the connection of a stag and a hind (or of an old woman), which was accompanied by the singing of unchaste songs. From English customs at the New-Year's Day, we may also infer that the hunter's shooting at this pair was even a few centuries ago, nay, is even now, not quite forgotten. Now as the time of the " twelve days " was with our ancestors the holiest of the whole year, and the gods were believed to descend at that time from heaven and to visit the abodes of men, we may firmly believe that this representation also was a scene of the life of the Gods. I hope

to have thus proved that the Brahmanical and the German traditions are almost fully equal, and I have finally attempted to lay open the idea from which the ancient myth proceeded. According to my explanations, our common Indo-European ancestors believed that the sun and the day-light (which was, so to say, personified under the image of various animals, as a cow or bull, a horse, a boar, a stag), was every day killed in the evening and yet re-appeared almost unhurt, the next morning. Yet a decay of his power was clearly visible in the time from midsummer to midwinter, in which latter time, in the more northern regions he almost wholly disappears, and in northern Germany, during the time of the twelve days, is seldom to be seen, the heavens being then usually covered all over with clouds. I have therefore supposed, it was formerly believed that the sun was then completely destroyed by a God, who was both a God of night and winter as also of storm, Rudra = Wodan. The relics of the destroyed sun, they seem to have recognised in the brightest constellations of the winter months, December and January, that is, in Orion and the surrounding stars. But when they saw that they had been deceived and the sun re appeared the myth gained the further development of the seed of Prajâpati, from the remnants of which a new Âditya as well as all bright and shining Gods were produced. I have further shown that both Greek astronomy and German tradition proved to be in an intimate relation with the Brahmanical tradition; for the former shows us, in almost the same place of the celestial sphere, a gigantic hunter (Mṛigavyâdha, Sirius; Orion, the hunter Mṛigashiras); whilst the latter has not yet forgotten that Saint Hubertus, the stag-killer, who is nothing but a

representative of the God Wodan, who had, like Rudra, the power of healing all diseases (the *bhiṣhaktama* of the Vedas) and particularly possessed cures for mad dogs which not only were his favourite companions, but were also in near connection with the hottest season of the year, when the declining of the sun begins, the so-called *dog-days*."

Here is an equally striking coincidence between the German and the Vedic traditions. The mummeries were performed "*at the close of the old year* and *at the beginning of the new one*," and the stag and the hunter had therefore something to do with it. Prof. Kuhn's explanation does not clear up this point satisfactorily, nor does it give any reason why the festivals were celebrated only during the *twelve days* preceding the new year. As regards the decay of the sun's power it must have been observable during the whole season and does not therefore in any way account for the selection of 12 particular days. As for the *dvâdashâha* of the Indians, it is the period during which a person consecrates himself for a yearly sacrifice and so must naturally precede the commencement of the new year when the annual sacrifice commences, and I have previously shewn that it represents the difference between the lunar and the solar years; in other words, they were what we may now call the intercalary days added at the end of each year to keep the concurrence of the lunar and the solar measures of time. The German traditions therefore can be better accounted for, if we suppose that they are the reminiscences of a time when the stag and the hunter actually commenced the year. This also explains why the dog-days were considered so important. When Sirius or the dog-star rose with the sun at the beginning of the year, the dog-days, or rather the days when the dog was not visible, were

the new-year's days, and as such they were naturally invested with an importance which they never lost. I have already alluded to the passage in the Rigveda which states that the dog awakened the Ṛibhus, or the gods of the seasons, at the end of the year, and this appears to me to be the origin of what are still known as dog-days in the western countries. Owing to the precession of the equinoxes and by neglecting to maintain the correspondence of the seasons the days now fall during a period different from the one they did of old, but such differences we find in all cases where ancient rites or festivals are preserved. The feast of the manes, which the Parsis and the Hindus seem to have commenced together when the summer solstice occurred in the month of Bhâdrapada, now no longer coincides with the summer solstice; but for that reason we cannot say that it might not have occured originally at the summer solstice, especially when the later supposition is supported by other reliable evidence, and gives a better origin of the festival. I am not therefore disposed to accept Prof. Kuhn's explanation as satisfactory, and am of opinion that the German traditions are the reminiscences of a time when the vernal equinox was in Orion, the hunter. We cannot otherwise account why the mummeries and festivals should have been celebrated during the *twelve* days at the *end* of the old and the *beginning* of the new year.

It will, I think, be evident from this that the Greeks and Germans have preserved the memory of the days when the year commenced with the vernal equinox in Orion. I have previously shown that the Parsi primitive calendar, as fixed by Dr. Geiger, points to the same conclusion. The Parsis, the Greeks, the Germans and the Indians therefore appear to have separated after these traditions were formed and after Orion was figured, and recognised as the *Âgrayaṇa*

constellation. I do not think that any more traditional coincidences are necessary to establish the Aryan origin of the constellation of Orion, as well as its position at the vernal equinox in old days. I shall, however, give one more coincidence which on account of its peculiar nature is alike interesting and important.

In the Greek mythology Orion, after his death as above described, was placed among stars, "where he appears as a giant with a girdle, sword, a lion's skin, and a club."* Now, if as remarked by Plutarch, Orion is an original Greek name, we should find some traces of these various adjuncts of Orion or at least some of them in the old Iranian and Indian works. Do we so find them? I think we do, only if we look for them with a little more attention and care, for the transformation is more specific and peculiarly out of the way in this case. In the Vedic works Soma is said to be the presiding deity of the asterism of Mṛigashiras. Soma is Haoma with the Parsis. The 26th verse in the Haoma Yasht is as follows:—

> *Frâ te Mazdâo barat paurvanîm aivyâonghanem steher-paesanghem mainyu-tâstem vanghuhim-daenâm Mâzdayasnîm.*

which has been thus rendered by Mr. Mills in his translation of the Zend Avesta, Part III., in the Sacred Books of the East Series (P. 238):—"Forth has Mazda borne to thee, the star-bespangled girdle, the spirit-made, the ancient one, the Mazda-Yasnian Faith." Dr. Haug takes *paurvanîm* in the original to mean "leading the *paurvas*," which latter he believes to be the Persian name for the Pleiades, which is variously written *parû*, *parvah*, *parvîn* and *parviz*.† This keen-sighted suggestion of Dr. Haug has been pronounced

* See Smith's Dictionary of Classical Mythology.
† Dr. Haug's Essays on the Parsis, p. 182.

by Mr. Mills as "doubtful, and refuted by Vistasp Yasht 29, where Darmesteter renders a word probably akin as 'the many.'" But excepting this difference of opinion all agree in holding this Yasht to be an ancient one, "a reproduction of an Aryan original,"* and that the verse above given contains a description of the belt of Orion. Orion is Haoma, the Soma of the Indians which is its presiding deity in the Vedic works, and the above verse states that God has given a natural star-studded girdle to Haoma. This girdle is, therefore, no other than the belt of Orion. The verse in the Haoma Yasht, however suggests more than it denotes. Both Haug and Mills have used the word 'girdle' in the translation. But whether we use 'girdle' or 'belt,' it hardly conveys the idea of the original *aivyaonghanem*. It is a striking instance of how in translations we sometimes lose the force of the original. *Aivyaonghana* is a Zend word for the *kusti*, or the sacred thread of the Parsis, which they wear round their waist. The 'girdle' or the 'belt' of Orion is thus said to be his *kusti*, and though we may have no more traces of the 'belt' or the 'club' of Orion in the Parsi scriptures, the above verse at once directs our attention to the place where we may expect to find the traces of Orion's belt in the Indian works. I have before pointed out that Orion or Mṛigashiras is called Prajâpati in the Vedic works, otherwise called Yajna. A belt or girdle or a piece of cloth round the waist of Orion or Yajna will therefore be naturally named after him as *yajnopavîta*, the *upavîta*, or the cloth of Yajna. The term, however, now denotes the sacred thread of the Brâhmans, and it may naturally be asked whether it owes its character, if not

* See Sacred Books of the East Series, Vol. XXXI., Zend Avesta, Part III., p, 238.

the origin, to the belt of Orion. I think it does on the following grounds.

The word *yajnopavîta* is derived by all native scholars from *yajna* + *upavîta;* but there is a difference of opinion as to whether we should understand the compound to mean an '*upavîta* for *yajna*,' *i. e.*, *for* sacrificial purposes, or, whether it is the '*upavîta* of *yajna*.' The former is not incorrect, but authority is in favour of the latter. Thus the Prayoga-writers quote a *smṛiti* to the effect that "the High Soul is termed *yajna* by the *hotṛis**; this is *his upavîta;* therefore, it is *yajnopavîta*." A mantra, which is recited on the occasion of wearing the sacred thread means, "I bind you with the *upavîta* of *yajna* ;"† while the first half of the general formula with which a Brâhman always puts on his sacred thread is as follows :—

यज्ञोपवीतं परमं पवित्रम् प्रजापतेर्यत्सहजं पुरस्तात् ।

The mantra is not to be found in any of the existing Sanhitâs, but is given in the Brahmopanishad and by Baudhâyana. This verse is strikingly similar to the verse quoted above from the Haoma Yasht. It says, "*yaj*, *opavîta* is high and sacred ; it was born with Prajâpati, of old." The word *purastât* corresponds with *paurvanim* in the Avesta verse and thus decides the question raised by Dr. Haug while

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* पारिजाते स्मृतिसारेः—

यज्ञाख्यः परमात्मा य उच्यते चैव होतृभिः ।

उपवीतं यतोस्येदं तस्माद्यज्ञोपवीतकम् ॥

† See Târânâtha's Vâshaspatya s. v. *upavîta* ; and Sânkhyâyana Gṛihyasûtra, ii. 2. 3, where the mantra is given as follows :— यज्ञोपवीतमसि । यज्ञस्य त्वा यज्ञोपवीतेनोपनह्यामि । In the Pâraskara Gṛihyastûra, ii. 2. 11, both these mantras, यज्ञोपवीतं परमं &c., and यज्ञस्य त्वा &c., are given.

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sahaja,* born with the limbs of Prajâpati, conveys the same meaning as *mainyu-tâ stem.* The coincidence between these verses cannot be accidental, and it appears to me that the sacred thread must be derived from the belt of Orion. *Upavîta*, from *ve* to weave, literally means a piece of cloth and not a thread.† It appears, therefore, that a cloth worn round the waist was the primitive form of *yajnopavîta*, and that the idea of sacredness was introduced by the theory that it was to be a symbolic representation of Prajâpati's waist-cloth or belt. In the Taittirîya Sanhitâ (ii. 5. 11. 1.) *nivîta*, *prâchinâvîta* and *upavîta*, three words which at present denote the position of the sacred thread on the body of a Brâhman, are defined, but the Mîmânsakas‡ understand them to apply not to the sacred thread, as we now wear it, but to a piece of cloth or dear-skin, which everyone must use at the time of sacrificing. It appears, therefore, that in the oldest times the Brâhamans wore a piece of cloth or deer-skin and not a thread. This conclusion is further strengthened by the fact, that according to the ritual given in the Sûtras, no sacred thread is mentioned in the description of the ceremony of Upanayana ; § while the investiture with the

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* सहजं स्वभावभूतं अथवा देहेंद्रियादिभिः सहोत्पन्नम् । Shankarânanda's com. on Brahmopanishad (MS.).

† Cf Medhâtithi on Manu, ii. 44.

‡ Cf Jaiminîya nyâya-mâlâ vistâra, iii. 4. 1. अत्र प्रतीयमानं निवीतादिकं वासोविषयं । न त्रिवृत्सूत्रविषयं । "अजिनं वासो वा दक्षिणतः उपवीय" (Taitt. Arn., ii. 1) इत्यनेन सदृशत्वात् । वस्त्रस्य च निवीतं सौकर्याय प्राप्तम् । Taitt. Arn. ii. 1 is the only passage in the Vedic works which fully describes the positions निवीतं &c., and it expressly mentions वास and अजिन, but not सूत्र.

§ See Târânâtha's Vâchaspatya s. v. *upavîta*. Also Âshvalâyana Gṛihya Sutra i. 19, 8-10-12, where *ajina*, *mekhalâ* and *danda* are alone mentioned.

thread is looked upon at present as the principal part of that ceremony. We have still retained a memory of this old practice in the performance of obsequies and at the time of performing sacrifices, when a piece of cloth is worn in *addition* to the sacred thread. Devala* says that out of the three sacred threads to be worn, one is a substitute for the upper garment, thus clearly indicating what the old practice was. But this is not the place to go into these details. It is enough for our purpose to notice that *yajnopavita* originally, meant a piece of cloth, and that in the times of the *smriti*-writers, it came to be symbolically represented by the sacred thread, thrice twisted and thrice folded. There is, however, another difficulty which must be here noticed. The Parsis wear their sacred thread round the waist, while the Brâhmans usually wear it over the left shoulder and across the body, leaving the right arm free (*i e.*, *upavita*). The Parsis may thus be said to wear their sacred thread after the manner of Orion ; but in the case of the Brâhmans, it may be questioned if their manner of wearing the thread corresponds to the position of Orion's belt. From the passage in the Taittiriyâ Sanhitâ referred to above, it will, however, be seen that *nivita* (and not *upâvîta*), is the position of the thread there prescribed for all human actions, or, in other words, for doing all ordinary business of life. *Nivita* has been defined by all later writers to mean the position of the sacred thread passing around the neck, over both the shoulders and dropping down in front. A reference to Kumârila Bhaṭṭa's Tanra Vârtika (iii. 4. 2.), will, however, show that *nivîta* also meant " tying round the waist," and Kumârila observes that "tying round the waist is the most convenient position for all kinds of

* तृतीयमुत्तरीयार्थं वस्त्राभावे तदिष्यते ।

work."* Ânandagiri and Govindânanda in their commentaries on Shankara's Bhâṣhya on the Brahmasûtras (iii. 4. 19.), give the same explanation, from which it appears that the Brâhmans, like the Parsis, once wore the thread around the waist, thus literally *girding* up their *loins* when they had to do any work. The sacred thread of the Parsis and the Brâhmans thus seems to be a symbolical representation of Prajâpati's girdle or Orion's belt in every respect. The various stages, by which the original piece of cloth round the waist dwindled into a thread, are interesting and instructive from a ceremonial point of view, but not being relevant to the present inquiry, I do not mention them here.

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* As the passage is important as a record of now obsolete practice I give it here in the original—

निवीतं केचिद्गलवेणिकाबंधं स्मरंति । केचित्पुनः परिकरबंधं ।
तत्र गलवेणिकाबंधो युद्धादन्यत्र न प्राप्नोति । परिकरबंधस्तु
सर्वकर्मस्वव्यग्रताकरत्वात्प्राप्त इति ।

The word स्मरंति in this passage indicates that the writer had a स्मृति text in his mind. Mâdhava in his commentary on the Parâshara Smṛiti (Cal. Ed., p. 450) quotes Kâtyâyana and Devala as follows:—

कात्यायन:—पृष्ठवंशे च नाभ्यां च धृतं यद्विंदते कटिम् ।
तद्धार्यमुपवीतं स्यान्नातिलंबं न चोच्छ्रितम् ॥
देवल—स्तनादूर्ध्वमधो नाभेः नैव धार्यं कदाचन ।

I think these verses clearly indicate that the thread must be worn below the breast and above the navel, and going round the whole waist. As the practice has long since been obsolete, the verses have been much misunderstood by later writers. The author of the स्मृत्यर्थसार does, however, clearly state that there are two ways of wearing the thread, first over the shoulder as described in the Taitt. Arn. ii. 1; and (यद्वा in the original) second as given in the above texts of Kâtyayana and Devala. This view has also been adopted by the author of the संस्कारकौस्तुभ.

But the sacred thread is not the only trace of Orion's dress that we have retained. A reference to the Upanayana ceremonial will show that we have preserved belt, staff, skin, and all. Every boy, who is the subject of this ceremony, has to wear a *mekhalâ* or grass cord round his waist, and we still put three knots to this cord just over the navel, as it were, to represent the three stars in the belt of Orion.* In the Vâjasaneyi Sanhitâ 4. 10, we are told that the knot of the *mekhalâ*, when it is worn for sacrificial purposes, is to be tied with the mantra, "you are the knot of Soma,"† which Mahîdhara explains as "a knot dear to Soma ;" but which remembering that we have a similar verse in the Haoma Yasht, may be naturally interpreted to mean the knot of Soma, the presiding deity over the constellation of Orion. Then every boy whose *upanayana*, or the thread ceremony as it is popularly understood, is performed, must carry with him a stick of the *pâlasha* or the fig-tree and the same passage in the Vâjasaneyi Sanhitâ says that for sacrificial purposes the stick (*danḍa*) is to be taken in hand by the Mantra, "O wood ! be erect and protect me from sin till the end of this *yajna*." Here again Mahîdhara interprets *yajna* to mean sacrifice for which the staff is taken up.

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* In the Prayoga works we have (and we still do so) :—

मेखलां त्रिरावर्त्यं नाभिप्रदेशे ग्रंथित्रयं कुर्यात् ।

In the Sânkhyâyna Gṛihya Sutra ii. 2. 2, we are told that the knots of the *mekhalâ* may be one, three or five, and the commentator adds that the knots should be equal in nnmber to one's *pravaras* The author of the Sanskâra Kaustubha quotes a *smriti* to the same effect. But the explanation is unsuited to the first case, *viz.*, of one knot, and I am inclined to take it to be a later suggestion.

† सोमस्य नीविरसि ।

But I think here also we may trace a reference to Prajâpati *alias* Yajna. The third accompaniment of a newly initiated boy is the deer-skin. Theoretically it is necessary that he should be fully clothed in a deer-skin, but practically we now attach a small piece of deer-skin to a silk thread and wear this thread along with the *Yajnopavîta*. *Mekhalâ*, *ajina*, *danda* (the girdle, the skin and the staff) are thus the three distinguishing marks of a newly initiated boy; and what could they mean, except that the boy is made to assume the dress of Prajâpati as far as possible. To become a Brâhman is to imitate Prajâpati, the first of the Brâhmans. Prajâpati assumed the form of a deer, so the boy is clothed in a deer-skin ; Prajâpati has a girdle round his waist (the belt of Orion), so has the boy his *mekhalâ* with three knots over the navel ; and lastly, Prajâpati has a staff, and so the boy must have it too.*

* Dr. Schrader in his Preh. Ant. Ary. Peop., Part iv., Chap. viii., concludes that the primitive dress consisted of a piece of woolen or linen cloth thrown round the shoulders like a mantle, and a girdle. The history of *yajnopavîta*, the way of wearing it as described in Taitt. Arn. ii. 1., and Orion's dress, as conceived by the Greeks, point to the same conclusion. I have already alluded to the difficulty of explaining how *upavîta*, which literally means a cloth, came to denote a thread. If *yajnopavîta* be taken to have originally meant *yajna* and *upavîta*, and *yajna* be further supposed to have once denoted a girdle this difficulty is removed. Av. *yāsto* Gk. *zōstos*, Lith. *justas*, meaning "girded" point to an original root *jos*, Av. *yangh*, from which Gk *zōnu*, Av. *aiv yâonghana* may be derived (*See* Ficks' Indo Germ. Wort). If we suppose that the root appeared as *yaj* in Sanskrit and derive *yajna* from it, like Gk. *zōnu*, we may take *yajna* to mean a girdle and translate अयज्ञोपवीती कथं ब्राह्मण : (Jâbâl. Upa. 5.) by "how can a Brâman be without a girdle and a cloth.?" If this suggestion be correct, then *yajnopavîta* must be

Thus in their Upanayan ceremony the Brâhmans have fully preserved the original characteristic of the dress of Prajâpati or Orion. The Brâhman *baṭu* (boy) does not, however, carry a sword as Orion is supposed to do, and the skin used by the boy is deer's and not lion's. I cannot account for the first of these differences except on the ground that it might be a later addition to the equipment of Orion, the hunter. But the second might be traced to a mistake similar to that committed in the case of the seven *ṛikshas*. The word *Mṛiga* in the Rigveda, means according to the Sâyaṇa both a lion and a deer, and I have already referred to the doubts entertained by modern scholars as to the animal really denoted by it. *Mṛigâjina* is therefore likely to be mistaken for lions skin. There is thus an almost complete coincidence of form between Orion as figured by the Greeks and the boy whose *upanayana* is recently performed, and who is thus made to dress after the manner of Prajâpati. I do not mean to say that a piece of cloth was not worn round the waist before the constellation of Orion was so conceived ; on the contrary, it is more natural to suppose that the ancient

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taken to have meant nothing more than a mantle and a girdle in primitive times and that the primitive people invested Orion with a dress similar to their own. When Orion came to be looked upon as a celestial representation of Prajâpati, Orion's dress must have attained the sacred character which we find preserved in the sacred thread of the Parsis and the Brâmans. I, however, know of no passage in the Vedic literature where *yajna* is used in the sense of a girdle, and hence the above suggestion must be considered as very doubtful. But it may be here mentioned that in Marâṭhî we use the word *jânve* to denote the sacred thread. This word is evidently derived from Sk. *yâjna*, Prâkrita *jannö*. Perhaps we have retained onlyt he first word of the long compound *yajnopavita*.

people invested Orion with their own dress. But the coincidence of details above given does, in my opinion, fully establish the fact that the sacred character of a *baṭu's* dress was derived from what the ancient priests conceived to be the dress of Prajâpati. With these coincidences of details, still preserved, it is impossible to deny that the configuration of the constellation of Orion, is of Aryan origin and that the Hellenic, the Iranian and the Indian Aryas must have lived together when these traditions and legends were formed.

And now it may be asked that if the Eastern and the Western legends and traditions of Orion are so strikingly similar, if not identical, if the dress and the form of the constellation are shewn to have been the same amongst the different sections of the Aryan race, and if the constellations at the feet and in front of Orion—Canis Major and Canis Minor, Kuon and Prokuon,* Shvan and Prashvan, the Dog or the Foredog—are Aryan both in name and traditions; in short, if the figure, the costume, the attendants and the history of Orion are already recognised as Aryan is it not highly probable that the name, Orion, should itself be a transformation or corruption of an ancient Aryan word? Orion is an old Greek name. Homer in the fifth book of Odyssey speaks of the bold Orion and the traditional coincidences, mentioned above, fully establish the probability of Plutarch's statement that the word is not borrowed from a non-Aryan source. Two of the three names, mentioned by Plutarch Canis (*Kuon*) and Ursa (*Arktos*) have again been phonetically identified with Sanskrit *shvan* and *ṛikṣhas*, and we may, therefore, legitimately expect to find Orion similarly traced back to an Aryan original. The task, how-

* See note on page 119 *supra*.

ever, is not so easy as it appears to be at the first sight. The Greek mythology does not give us any help in the solution of this question. It tells us that a hunter by name Orion was transformed after his death into this constellation which consequently came to be called after him. But this is surely no satisfactory explanation. Who is the hunter that was so transformed? There are many mythological proper names in Greek which can be traced back to their Aryan originals, and why should Orion be not similarly derived? The story obviously points to the Vedic legends of Rudra, who is said to be still chasing Prajâpati in the heavens. The Vedic legend has fully preserved all the three elements in the story—the hunter Rudra, the dog and the antelope's head, while the Greeks appear to have retained only the hunter and the dog with nothing to hunt! But that does not preclude us from discovering the identity of these legends and the question is whether we can suggest a Sanskrit word which will give us Orion according to the already established phonetic rules. I know of no name of Rudra from which *Orion* can be so derived. But if we look to the names of the constellation of Mṛigashiras, we may, I think, in the absence of any better suggestion provisionally derive *Orion* from Sanskrit Âgayaṇa the original of *Agrahâyaṇa*; The intial long *â* in Sanskrit may be represented by omega in Greek as in Sk. *âma*, Gk. *ōmos*, Sk. *âshu*, Gr. *ōkus*, and the last word *ayana* may become *iōn* in Greek. It is not, however, so easy to account for the dropping of *g* before *r* in the body of the word. Comparison of Sk. *grâvan* which Gk. *laos* and of Sk. *ghrâna* with Gk. *ris*, *rinos*, shews that the change may take place *initially*, but scholars whom I have consulted think that there is no instance in which it takes place *medially*

between Greek and Sanskrit, though such changes are not rare between other languages as in Old Irish *ār*, Cymric *ear*, which K. Brugmann ‡ derives from* *agra*. Also compare Gk. *dakru*, Goth. *tagr*, Old Irish *dēr*, English *tear*; Latin *exagmen*, *examen*, O Ir. *ām*, from the root *aj*. I do not feel myself competent to decide the question, and hence must remain content with simply throwing out the suggestion for what it is worth. I have shewn that traditional coincidences clearly establish the possibility of the Aryan origin of Orion, and if I have not hit upon the correct word that does not affect my argument. My case does not, in fact, rest on phonetic coincidences. I rely principally upon certain statements in the Vedic works, which indicate that the vernal equinox was once in Orion, and I wanted to shew—and I think I have shewn it—that there is sufficient evidence in the Greek and Parsi legends to corroborate the statment in the Vedic works about the Phalgunî full-moon being once the first night of the year. We can now give a reasonable explanation of how Fravarshinam came to be the first month in the primitive Parsi calendar and why Dathusho should have been dedicated to Din (creator).†

‡ Comp. Gram., Vol. I. Arts. 518. 523. Prof. Max Müller extends the rule to Greek and Latin, see his Lectures on the Science of Language, Vol. II., p. 309, where several other instances are given. For a full statement of the phonetic difficulties in identifying Gk. *Orion* with Sk. *Āgrayaṇa*, see App. to this essay.

† By the bye it may be here remarked that we can perhaps better account for the names Ahuramazda and Ahriman on the theory that the vernal equinox was then in Orion, the winter solstice in Uttarâ Bhâdrapadâ and the summer solstice in Uttarâ Phalgunî. The presiding deities of the last two Nakshatras are respectively Ahir-Budhnya and Aryaman. According to the Avesta belief, which assigns the south to the Gods and the north to the Daevas, Ahir Budhnya, as the regent of the southermost

The mummeries and festivals amongst the Germans can also be more satisfactorily accounted for, while above all, the form the dress and the traditions of Orion may be now better traced and understood. I have already in the previous chapter shown that even the Vedic legends, especially those in the later works, can be simply and naturally explained on the assumption we have made regarding the position of the equinoxes in the days of the Rigveda. The hypothesis on which so many facts, legends, and traditions can be so naturally explained, may, in the absence of a better theory, be fairly accepted, as correct without more proof. But in the present case we can go still further and adduce even direct evidence, or *express* Vedic texts, in its

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point, would come to be regarded as the supreme ruler of the gods, while Aryaman would be the king of the evil spirits. Therefore we may suppose that the names Ahura Mazda and Ahriman, if not actually derived from these words, were, at least modelled after them. Amongst the names of the Vedic deities Ahir Budhnya is the only word, both the component members of which, are declined as in Ahura Mazda. Spent Mainyus and Anghra-Mainyus is a distinct pair by itself; and besides the difficulty of deriving Ahriman from Anghra Mainyus, there seems to be no reason why Ahriman, if so derived, should be contrasted with Ahura-Mazda. (*See* Phil. Mazd. Relig. by Casartelli, trans. by F. J. Dastur Jamasp Asa, §§ 71, 72, pp. 54-6.) Parsi mythology has another deity named Airyaman, and as this word is derived from Sanskrit Aryaman, it may be objected that same word cannot be said to have also given the name for the evil spirit. I do not think that the objection is well founded. Cf. Andra (Sk. Indra and Verethraghna (Sk. Vṛitrahan) both of which are the names of the same deity in Sanskrit, but one of which has become an evil spirit in the Avesta. But I cannot fully discuss the subject in a note, and not being pertinent to my case, I cannot also do more than merely record here an explanation that may possibly be suggested.

support. In the chapter on the Kṛittikâs, I have drawn attention to the remarks of Prof. Max Müller who objected to the conclusion based entirely on the Vedânga Jyotisha on the ground that no allusion to the position of the Kṛittikas was to be found in the Vedic hymns. We can now account for this silence ; for how can the hymns, which appear to be sung when the sun was in Orion at the beginning of the year, contain any allusion to the period when the vernal equinox fell in the Kṛittikâs? This could have been easily perceived if, instead of confining to the controversy about the position of the Kṛittikâs and endeavouring to find out if some clue to the date of the Veda could be obtained from the determination of the original number and source of the Nakshatras, scholars had pushed their inquiries further back and examined the Vedic hymns in the same critical spirit. It would not have been difficult in that case to discover the real meaning of the Vedic verse which states that "the dog awakened the Ṛibhus at the end of the year." I have in a previous chapter already referred to the verses in the Rigveda regarding the position of Yama's dogs and the death of Namuchi. These passages, as well as the description of *Vṛika* or the dog-star rising before the sun after crossing the eternal waters, the terminus of the Devayâna (Rig. i. 105. 11.), sufficiently indicate the position of the equinoxes in those days. In the next chapter I propose to discuss and examine two other important passages from the Rigveda, which *directly* bear out the statement in the Taittîrya Sanhitâ with which we have started, *viz.*, that the Phalgunî full-moon commenced the year at the winter solstice in days previous to those of the Taittîrya Sanhitâ and the Brâhmaṇs.

CHAPTER VII.

ṚIBHUS AND VṚISHAKAPI.

Knowledge of astronomy in Vedic times—The seasons and the year—The *ayanas*—The zodiacal belt or *rita*—Observation of a total eclipse of the sun in the Rigveda—Knowledge of the planets—Shukra and Manthin—Venus and Vena, Shukra and Kupris—The legend of the Ribhus—Their identification with the Ritus or the seasons of the year—Their sleep or rest in Agohya's (sun's) house for 12 intercalary days— said to be awakened by dog (Rig. i. 161. 13) at the end of the year—Indicates the commencement of the year with the dog-star—Nature and character of Vṛishâkapi—His identification with the sun at the autumnal equinox—The hymn of Vṛishâkapi in the Rigveda x 80—Its Meaning discussed verse by verse—Cessation and commencement of sacrifices on the appearance and disappearance of Vṛishâkapi in the form of a Mṛiga—Indrâṇî cuts off his head and sets a dog at his ear—Orion (Mṛigashiras) and Canis—Meaning of *nedîyas* in the Vedic literature—When Vṛishâkapi enters the house of Indra, his Mṛiga becomes invisible (Rig x. 86. 22.)—Points to the vernal equinox in Orion or Mṛiga—Leading incidents in the story stated and explained.

IT is said that we cannot suppose that the Vedic bards were acquainted even with the simplest motions of heavenly bodies. The statement, however, is too general and vague to be criticised and examined. If it is intended to be understood in the sense that the complex machinery of observation which the modern astronomers possess and the results which they have obtained thereby were unknown in early days, then I think there cannot be two opinions on that point. But if by it is meant that the Vedic poets were ignorant of everything except the sun and the dawn, ignorant of the Nakshatras, ignorant of month, *ayanas,* years and so on, then there is no authority or support for such a supposition in the Rigveda. On the contrary, we

find that some of the Nakshatras are specifically named, such as *Arjunî* and *Aghâ* in Rig. x. 85. 13, while the same hymn speaks generally of the Nakhatras, and the motions of the moon and the sun as causing the seasons. In Rig. i. 164 we have again several references to the seasons, the year and the number of days contained in it (verse 48) and according to Yâska, perhaps to the *ayanas* (Nirukta 7. 24). I have in a previous chapter referred to the passages in the Rigveda, which mention the Devayâna and the Pitṛiyāna, the old names of the *ayanas* beginning with the vernal equinox; and there is, therefore, no objection to understand the above verse (i. 164. 48) as alluding to the black or the Pitṛiyâna. The intercalary month is mentioned in Rig. i. 25. 8. while in i. 24. 8 Varuṇa is said to have constructed a broad path for the sun, which appears evidently to refer to the Zodiacal belt. I am further inclined to think that the path of *ṛita* (Rig. i. 41. 4) which is mentioned several times in the Rigveda, where the Âdityas are said to be placed (x. 85. 1), and wherein Saramâ discovered the cows of Indra (v. 45. 7, 8) refers to the same broad belt of the Zodiac which the luminaries, as observed by the Vedic bards, never transgressed. It was so to speak their 'right' way, and therefore called *ṛita*, which though literally derived from *ṛi* to go, soon came to mean the 'right,' path the *circle* of which exists for ever, or rather exists and exists (*varvarti*) in the vault of the heavens (Rig. i. 164. 11). Prof. Ludwig goes further and holds that the Rigveda mentions the inclination of the ecliptic with the equator (i. 110. 2) and the axis of the earth (x. 89. 4). It is now generally admitted that the seven *ṛikṣhas* were also known and named at this time. The mention of a hundred physicians in Rig. i. 24. 9 may again be taken

to represent the asterism of *Shata-bhiṣhak* or *Shata-târakâ*, presided over by Varuṇa according to the later lists of the Nakshatras in the Taittirîya Brâhmana. The fortieth hymn in the fifth Mandala of the Rigveda is still more important in this connection. It shows that an eclipse of the sun was then first observed with any pretensions to accuracy by the sage Atri.* It is thus that I understand the last verse in the hymn which, after describing the eclipse, says, "Atri alone knew him (the sun) none else could." This observation of the solar eclipse is noticed in the Sânkhyâyana (24. 3) and also in the Tâṇḍya Brâhmaṇa (iv. 5. 2; 6. 14), in the former of which it is said to have occurred three days previous to the *Viṣhûvân* (the autumnal equinox). The observation thus appears to have attracted considerable attention in those days. It seems to have been a total eclipse of the sun, and the stars became visible during the time, for I so interpret the expression, *bhuvanâni adîdhayuh* in verse 5. In verse 6 we are told

* Prof. Ludwig has tried to deduce the date of the hymn from this circumstance. But the attempt is a failure as shewn by Prof. Whitney (see the Proceedings of the American Oriental Society, Vol. XIII., pp. 17 22) As the eclipses recur in the same order after a certain period, we cannot use such facts for chronological purposes without knowing the geographical position of the place where the eclipse occurred, and even then the conclusion will be correct only if it can be shown on independent grounds that such a phenomenon did not occur at that place during several centuries before or after the date we determine. I, therefore, simply use the hymn for the purpose of showing that an eclipse of the sun was observed in those days in such a way as to leave a record behind. It would be difficult to deduce any other reliable conclusion from it even upon the assumption, not known and hence not used by Prof. Ludwig, that the vernal equinox was then in Orion and that the eclipse occurred three days before the autumnal equinox as described in the Brâhmaṇas. I cannot, however, accept the suggestion that the hymn may be understood as referring to the obscuration of the sun by clouds.

that "Atri knew (the eclipsed sun) by *turîya brahma*," and Sâyaṇa interprets the last two words to mean "the fourth verse or mantra." But the verse wherein these words occur is itself the sixth, and Sâyaṇa has to explain that by "fourth" is to be understood the "fourth, if we count from the sixth, *i. e*, the tenth verse!" The explanation may be good from the ritualistic point of view, but it appears to me to be quite unsatisfactory otherwise. I would rather interpret *turîyeṇa brahmaṇâ* to mean "by means of *turîya*." *Turîya* is mentioned in modern astronomical works as a name for an instrument called quadrant (Siddhânta Shiromaṇi x. 15), and though we may not suppose the same instrument to have existed in the old Vedic days, yet there seems to be no objection to hold that it may have meant *some* instrument of observation. The word *brahma* is no doubt used to denote a mantra, but it may also mean knowledge or the means of acquiring such knowledge. In Rig. ii. 2. 7 Sâyaṇa has himself interpreted *brahma* to mean some "act or action;" and I see no reason why we should not understand the phrase *turîyeṇa brahmaṇâ* in the above hymn to mean "by the action of *turîya*," or, in other words, "by means of *turîya*," and thus give to the whole hymn a simple and natural appearance, rather than endeavour to interpret it after the manner of the Red Indians, who believed that Columbus averted the calamity of the eclipse by prayers. The peasants of the Vedic times, some scholars might argue, cannot be considered to be more civilized than the Red Indians; but in so arguing they forget the fact that there must be a Columbus, who would, by his superior capacity, inspire the feelings of awe and reverence for him. When the bards, therefore, tell us that Atri knew of the eclipse by *turîya brahma*, we can now easily see what it means.

Sâyaṇa's explanation, as I have above observed, may be good from the ritualistic standpoint; but we cannot, for other purposes, accept an interpretation which makes the 'fourth' to mean the 'tenth' verse of the hymn! Thus understood the hymn clearly indicates that at the time when the observation was taken the Vedic priests were tolerably well acquainted with the elementary astronomical facts. It is, however, suggested that the planets were unknown in these days. I am unable to accept even this statement. It is impossible to suppose that the Vedic poets, who constantly watched and observed the various Nakshatras in the Zodiac, should not have noticed planets like Venus, Jupiter, or Saturn, which outshine many of the Nakshatras in brilliancy. The periodical appearance of Venus in the west and the east, and especially its rising only to a certain altitude followed by its regress, are facts too striking to remain unnoticed even by the superficial observers of the heaven. But we must not go on mere probabilities. The hymns of the Rigveda are before us, and though probabilities may serve the purpose of determining the direction of our search, yet if we cannot find any reference to the planets in the Vedic works themselves we must give up the notion that they were known to the poets of these hymns. There is no question that planets were known in the days of the Brâhmaṇas. In the Taittirîya Brâhmaṇa (iii. 1. 1. 5) we are told that Bṛihaspati (Jupiter) was first born * near the asterism of Tishya, and to this day the conjunction of Tishya and Jupiter is considered as highly auspicious in the astrological works. We have, how-

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* बृहस्पतिः प्रथमं जायमानः तिष्यं नक्षत्रं प्रादुर्बभूव। This reminds us of Rig. iv. 50. 4, where similar wording occurs, thus:— बृहस्पतिः प्रथमं जायमानोमहो ज्योतिषः परमे व्योमन् ।

ever, to look for any allusion to the planets in the Rigveda itself. The mention of the five bulls in Rig. i. 105. 10 may not be considered as sufficiently explicit to denote the five planets ;* but what shall we say to the mention of Shukra and Manthin together in Rig. iii. 32. 2 and ix. 46. 4 ? They seem to be evident references to the vessels called Shukra and Manthin used in sacrifices and have been so interpreted by the commentators. But as I have before observed, the vessels in the sacrifice themselves appear to have derived their names from the heavenly bodies and deities known at the time. It is generally conceded that the sacrificial arrangements more or less represent the motions of the sun † and the chief events of the year. In other words, the yearly sacrifice is nothing but a symbolical representation or rather imitation of the sun's yearly course. If so, it is natural to suppose that some of the sacrificial vessels at least were named after the Nakshatras and the planets. In the Taittirîya Sanhitâ iii. 1. 6. 3. the vessels are spoken of as 'the vessels *of* Shukra,' 'the vessels *of* Manthin,' and so on, which indicates that Shukra and Manthin were not used as adjectives of the vessels. The only other explanation is to suppose that Shukra, Manthin, Âgrayaṇa, &c., were the names of Soma juice, and that the vessels used for holding that juice in its various capacities, were described as the vessels of Shukra, &c. There is, however, no authority in the sacrificial literature for holding that Soma really had so many and *such* different capacities ; and I therefore

* Cf. Rig. i. 162. 18; x. 55. 8. Also see Kaegi's Rigveda (translated by Arrowsmith), p. 20, and note 67 on page 115. I hold that the planets were not only known, but some of them at least had already received their names by this time.

† See Dr. Haug's Intr. Ait. Br., p. 46.

conclude that the mention of Shukra and Manthin, as applied to vessels, in the Rigveda is a clear indication of the planets being then discovered. There is, however, in my opinion, a more explicit reference to a planet in the Rigveda which does not seem to have yet been noticed. In the tenth Mandala we have a hymn (123) dedicated to Vena which according to Yâska denotes a deity of the middle region. Yâska (Nirukta 10. 38) derives the word from *ven* 'to love,' 'to desire,' and explains it as denoting, as his commentator Durgâchârya says, "loved by all;"* while the hymn itself contains such expressions as the "son of the sun," "on the top of *ṛita*," "com es out of the ocean like a wave," † &c., which have been variously interpreted by the commentators. But from all these facts I think we have herein the original Aryan name of Venus. The word, or rather the meaning I have here proposed, is entirely lost in the Sanskrit literature, but considering the fact that the Latins named the planet as Venus, while the word cannot be satisfactorily derived from any Latin root,‡ there can be no objection to identify Venus with the Vena (nom. sin. Venas) in the Vedic works. In the Latin mythology Venus is the goddess of love, and this we can now easily account for, as the name of the Vedic deity is derived from a root which means "to desire," "to love." I may again point out that the hymn of Vena in the Rigveda, is used in sacrifices at the time, when the priest

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* See Mahîdhara on Vaj. San. 7. 16. Some consider that the root is *Vin* and not *Ven.*

† This reminds one of the tradition of Aphrodite who, in Greek mythology, is said to be sprung from the foam of the sea.

‡ In Dr. White's Latin English Dictionary the word is derived from Sanskrit *van* to love; but if it is to be derived from a Sanskrit root why not derive it from *vin* or *ven* to desire or love, and so connect it with *Vena* of the Rigveda.

takes up the vessel Shukra in the sacrificial ceremonies.* Kâtyâyana, indeed, mentions the optional use of the hymn for taking up the vessel of Manthin.† But that does not much alter the position, for, when the meaning of the word was utterly forgotten the hymn might come to be used for a different purpose in addition to the previous one. The fact, that the Vena hymn was used in taking up the Shukra vessel is, therefore, an important indication of its old meaning, and when we find the name actually preserved till now indicating the planet Venus, and that this name cannot be satisfactorily derived in any other way, we might fairly infer that Vena of the Rigveda is Venus of the Latin mythology. As regards the change of gender we need not consider it to be a serious objection inasmuch as not only Venus, but also the moon has changed in gender in its passage to Europe. As a further proof of the statement that the planets, or at any rate Shukra, was discovered and named in the primitive period, I refer to the Greek word *Kupris* (Latin *Cypris*) which means Venus. The word can be easily identified with Sanskrit *Shukra* which, according to the well-established phonetic rules, becomes *Kupros* in Greek, the initial *sh* being changed to *k*, as in Sk. *shvan*, Gk. *kuon* and the medial *kr* to *pr* by labialisation, cf. Gk.

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* See Durgâchârya on Nirukta 10. 39. शुक्रो ग्रहोऽनया गृह्यते.

† The Sûtrâs of Kâtyâyana bearing on this point are as follows:-- (See Kât. Shr. Su. ix. 6. 11—13) शुक्रं बैल्वेन वा तं प्रत्नथेति। अयं वेन इत्येके। मंथिनमयं वेन इति।. Thus he first lays down that the Shukra vessel be taken by reciting the hymn तं प्रत्नथा &c. (Vaj San. 7. 12) or according to some the hymn अयं वेनः &c. (Vaj. San 7. 16. Rig x. 123). He then observes that this latter hymn is used in taking up the Manthin vessel.

priamai, Sk. *krī-ṇāmi*, I purchase. As Venus was supposed to be a feminine deity in Europe *Kupros* was naturally changed into *Kupris*. Thus, both the Latin and the Greek names of the deity may be traced back to the Vedic Vena and Shukra, and we may therefore hold that the planet was discovered and named before these races separated. I know that European lexicologists derive *Kupris* from *Kupros* the Greek name of the island of Cyprus where Venus was said to be much worshipped and that Cyprus again is supposed to have received its name from the trees, cypresses, in which it abounds ! But the explanation, which gives no derivation for the name of the tree, seems to me to be quite unsatisfactory. If Aphrodite was known to the Greeks in the primitive times it is more natural to derive the name of the island from the name of the deity. In course of time this original connection between the name of the deity and that of the island may have been forgotten, and Greek writers regarded *Kupris* as born in Cyprus. But we must receive these derivations of Greek mythological proper names with great caution as most them have been suggested at a time when comparative Philology and comparative Mythology were unknown. Latin *cuprum* meaning 'copper' is again said to be derived from Cyprus (Gk. *Kupros*), but it does not affect our argument, for whatever be the reason for giving the name to the island, once it was named Cyprus or Kupros, many other words may be derived from it without any reference to the reasons for which the island was so called.

Some of the reasons given above may be doubtful, but on the whole I am inclined to hold that the Vedic Ṛishis were not as ignorant of the broad astronomical facts as they are sometimes represented to be. They seem to have watched

and observed the sun and the moon during their yearly course, noted the bearing of the motions on the division of time, fixed the length of the solar year and endeavoured to make the lunar correspond with it. The Nakshatras and their rising and setting also appear to have been duly observed. It was perceived that the sun and the moon and such of the planets as they had discovered never travelled out of a certain belt in the heavens, called *ṛita* ; while the eclipses of the sun and the moon also received due attention and notice. Men, who were acquainted with these facts, would naturally be able to fix the beginning of the months and the year by the stars that rose at the time, and though we cannot suppose the Vedic bards to have been in the possession of any accurate astronomical instruments, yet it was not difficult for them to decide roughly by simple observation when the day and the night were equal, or when the sun turned to the north, either from the solstitial or from the equinoctial point. The knowledge implied by these observations may appear to be too much for a Vedic poet in the opinion of those who have formed their notions of primitive humanity from the accounts of savages in Africa or the Islands of the Pacific. But as observed before we must give up these *a priori* notions of primitive humanity in the face of evidence supplied by the hymns of the Rigveda. It is on this evidence that we have to form our judgment of the primitive Aryan civilization, and if that evidence is found conflicting with our prepossessions, the latter must be given up. In what follows I shall therefore assume the capacity of a Vedic bard to make the simple observations above mentioned.

We shall now take up the verse in the Rigveda, referred to several times previously, the verse, which declares that a dog awakened the Ṛibhus at the end of the year. (Rig.

i. 161. 13); and the first question that arises in this connection is, who are the Ṛibhus? Referring to Nirukta (11. 15 and 16) we find that native scholars consider that the three Ṛibhus—Ṛibhu, Vibhvan and Vâja—were the sons of Sudhanvan and that having rendered wonderous services to the Gods they gained divine honors and a share in the sacrifice and immortality.* But even Yâska does not seem to be satisfied with this explanation. There are several hymns in the Rigveda wherein the deeds of the Ṛibhus are described (Rig. iv. 33-37; i. 20. 110. 111 and 161), and in most of them the Ṛibhus are spoken of as working in close connection with the year (*samvatsam* or *samvatsara*). Thus in the Rigveda i. 110. 4. they are said to have commenced work at the end of the year, and in iv. 33. 4. they are described as engaged, for the whole year (*samvatsam*), in reviving the cows (the rays of the sun). The Ṛibhus are further mentioned as resting in the house of Agohya, the "unconcealable" sun-god for twelve days at the end of their course (Rig. iv. 33. 7). In Ait. Br. iii. 30 they are described as sun's neighbours or pupils (*ante vâsâs*); while in Rig. iv. 51. 6 their work is said to be done by the dawn. Yâska therefore considers that the Ṛibhus also represented the rays of the sun, and in this he is followed by Sâyaṇa. But the explanation does not account for the *number* of the Ṛibhus who are said to be *three* brothers. We must therefore go a step further and hold that the Ṛibhus did not merely represent the rays of the sun generally, but the *three* seasons, as connected with them, as several European scholars have suggested.† In the Rigveda iv. 34. 2, the

* Also compare Brihad-devatâ iii. 81. 88; p. 82, Cal. Ed., where the same story is given.

† See Kaegi's Rigveda, p. 37, and note 127 on page 133. Particularly see Ludwig's Rig. iii., pp. 187 9.

Ṛibhus are told to rejoice with the seasons (Ṛitus) and this supports the latter view. In Rig. i. 15. 10, Draviṇodâ is said to be the *fourth* companion of the seasons and the Shatapatha Brâhmaṇa (xiv. 1. 1. 28) expressly states that there are three seasons. It is therefore generally believed that this was the old division of the year, and that the number of the seasons was increased as the Aryas travelled further from their original home.* The three Ṛibhus, representing the three seasons, may thus be said to be engaged, throughout the whole year, in doing wonders for the gods and received as guests in the house of Agohya at the end of their course. "Here they spend twelve days in enjoyment; then the course begins anew, and anew the earth brings forth fruit, the streams flow; plants cover the heights, and waters the depths."† And now comes the verse (Rig. i. 161. 13) on which I rely:—

सुषुप्वांस ऋभवस्तदपृच्छतागोह्य क इदं नो अबूबुधत्।
श्वानं बस्तो बोधयितारमब्रवीत्संवत्सर इदमद्या व्यख्यत ॥

Here the Ṛibhus, awakened from their sleep and rest for twelve days, ask "Agohya! Who is it that awakened us?"‡ The goat (the sun) replies that it is the "hound." Sâyaṇa understands *shvânam* to mean 'wind,' but there is no authority for it and the meaning is perfectly unnatural. In fact Sâyaṇa may be said to have failed to interpret the

* Kaegi's Rigveda, p. 116, note 68, where he quotes Zimmer to the same effect.

† This is in substance a translation of Rig. i. 161. 11 and iv. 33. 4. See Kaegi's Rigveda, p 37.

‡ *Idam* in the first line is not the object of *abûbudhat* as Sâyaṇa and Mr. S. P. Pandit suppose. It should be taken either in apposition with *tat*, or as an adverb meaning 'now,' 'here,' &c.

verse correctly. Ludwig and Grassmann both translate it by 'hound,' but neither of them explains what it signifies. There is again some difference of opinion as to whether the word *samvatsare* should be taken with *bodhayitâram* or with *vyakhyata*. But whichsoever construction we adopt the meaning remains the same, since it is the same thing if the Ṛibhus are said to be awakened at the end of the year and then commenced their course, or they awakened and then looked up at the beginning of the new year, or in other words, commenced their new-year's course. Practically, therefore, all agree in holding that the awakening of the Ṛibhus here referred to is their awakening at the end of the year, after they have enjoyed sound sleep and rest in the house of Agohya for twelve (intercalary) days, and the only question that remains is, who is the hound or the dog that awakens them ? We have seen that the Ṛibhus were the genii of the seasons and that as companions of the sun they worked wonders during the whole course of the year. But as it was a lunar year, 12 days were intercalated at the end of each year to make it correspond with the solar year. These 12 days belonged neither to the old nor to the new year, and the Ṛibhus were therefore naturally believed to suspend work during this *neutral* period and spend it in rest and enjoyment in the house of Agohya. When the whole legend has thus a chronological signification it is natural to hold that the hound, here alluded to, must be some constellation in the heavens, and if so, after what has been said in the previous chapters about it, what could it be except Canis Major or the Dog-star ? The end of the year here referred to is evidently the end of the three seasons, represented by the three Ṛibhus, and we must, therefore, take

it to mean the end of the equinoctial year or the beginning of Vasanta, the first of the seasons. Durgâchârya in his commentary on Nirukta 11. 16 explains the phrase *samvatsare* (in Rig. i. 110. 4) in the same way. As I have already discussed the subject before,* I do not here repeat the grounds on which I hold that the year, in primitive times commenced with the vernal equinox. Prof. Ludwig has made a happy suggestion that *âbhogaya*, which the Ṛibhus are said to desire (Rig i. 110. 2) before they commence their career and reach the house of the sun, should be interpreted in its ordinary sense to mean the *bend* or the inclination of the ecliptic with the equator. Our investigation based upon independent facts leads us to the same conclusion. In short, the whole story of the Ṛibhus, as we find it recorded in the Rigveda, directly establishes the fact that at the time when this legend was formed the year commenced with the vernal equinox in Canis Major or the Dog-star. It is highly improbable, if not impossible, to give any other reasonable interpretation to the verse in question, whether we understand the Ṛibhus to mean the three seasons of the year or the rays of the sun as Yâska and Sâyaṇa have done. With the vernal equinox near the Dog-star, the winter solstice would fall on the full-moon in Phâlguna and Mṛigashiras would head the list of the Nakshatras. Our interpretation of the verse in question is, therefore, fully warranted by the traditions about the ancient year-beginnings given in the Taittirîya Sanhitâ and the Brâhmaṇas.

Let us now examine the too much and too long misunderstood or rather not-understood hymn of Vṛishâkapi in the tenth Mandala of the Rigveda. As there is only one

* See *supra*, Chapter II.

hymn in the Rigveda which gives the story, it is not so easy, as in the case of the Ṛibhus, to determine the nature of the deity, and hence various conjectures have been made by scholars as to its origin, character and meaning. The deities appear both in the masculine and in the feminine form, Vṛishâkapi and Vṛishâkapâyî. Amara* considers that Vṛishâkapi means either Vishṇu or Shiva, and Vṛishâkapâyî either Lakshmî or Gaurî. In the Bṛihad-devatâ Vṛishâkapi is said to represent the setting sun, and Vṛishâkapâyî the gloaming.† Yâska (12. 27) would derive the word so as to mean the sun who shakes (the world) with his rays, and his commentator observes that the god showers mist or dew and shakes the animate world. Modern speculations about the derivation and the meaning of the name may be found in Bhânu Dikshita's commentary on Amara (iii. 3. 130). Prof. Max Müller, in one place,‡ observes that "it is difficult, on seeing the name of Vṛishâkapi, not to think

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* Amara iii. 3. 130 and 156. हरो विष्णुर्वृषाकपिः । and वृषाकपायी श्रीगौर्योः ।

† Bṛihat-Devatâ ii. 9. and 10:—

वृषाकपायी सूर्योषाः सूर्यस्यैव तु पत्नयः ।
पुरोदयात्तामुषसं सूर्यांमध्यंदिने स्थिते ।
वृषाकपायीं सूर्यास्तकाल आहुः स्तुतिष्वृचि ॥

And, again futher on in ii. 69 and 70.

वृषैव कपिलो भूत्वा यन्नाकमधिरोहति ।
वृषाकपिरसौ तेन विश्वस्मादिंद्र उत्तरः ॥
रश्मिभिः कंपयन्नेति वृषा वर्षिष्ठ एव सः ।
सायाह्नकाले भूतानि स्वापयन्नस्तमेति च ।
वृषाकपिरितो वा स्यादिति मंत्रेषु दृश्यते ॥

‡ Lectures on the Science of Language Vol. II., p. 539.

of *Erikapaeos*, an Orphic name of *Protogonos* and synonymous with *Phanes*, *Helios*, *Priapos*, *Dionysos*," but, says he, "the original conception of Vṛishâkapi (*Vṛishan*, bull, irrigator; *Kapi*, ape, tremulous) is not much clearer than that of *Erikapaeos*." However, if the comparison be correct, we may, I think, take it as confirming the identification of Vṛishâkapi with the sun proposed by several scholars, native and European. In fact, there seems to be a general agreement that Vṛishâkapi represents the sun in one form or the other. But this alone does not account for all the incidents recorded in the hymn. I would, therefore, further suggest that Vṛishâkapi be understood as representing the *sun at the autumnal equinox*, when he may be rightly said to shake off the rains, inasmuch as the equinox falls at the end of the rainy season. I have previously shown that the conception of Vishṇu and Shiva can be traced to the Vedic Vishṇu and Rudra, and these latter may be taken as the types or the embodiments of the mild and terrible aspects of nature at the vernal and the autumnal equinox. If Vṛishâkapi in later mythology has therefore come to denote Vishṇu and Shiva, according to Amara, the meanings are consistent with the supposition that in the Vedas Vṛishâkapi represents the sun at the equinoxes. In the hymn itself, Vṛishâkapi is said to have assumed the form of a yellow antelope whose head Indrâṇî is described to have cut off. This circumstance serves to guide us in at once fixing the position of Vṛishâkapi in the heavens. It is the same antelope's head that has given rise to so many myths. When the position of Vṛishâkapi is thus fixed, it would not be difficult to understand the various incidents described in the hymn. But without further anticipating what I have to say in the explanation of the hymn, I

now proceed to examine the hymn itself. We shall then see whether the assumption which we have made regarding the character and attributes of Vṛishâkapi gives us a simple, natural, and above all, intelligible explanation of the story given in the hymn, which, as explained at present, is nothing but a bundle of disconnected, if not mutually inconsistent, statements. I shall first quote the original hymn.

वि हि सोतोरसृक्षत नेंद्रं देवममंसत ।
यत्रामदद्वृषाकपिरर्यः पुष्टेषु मत्सखा विश्वस्मादिंद्र उत्तरः ॥१॥
परा हींद्र धावसि वृषाकपेरति व्यथिः ।
नो अह प्र विंदस्यन्यत्र सोमपीतये विश्व० ॥ २ ॥
किमयं त्वां वृषाकपिश्चकार हरितो मृगः ।
यस्मा इरस्यसीदु न्वर्यो वा पुष्टिमद्वसु विश्व० ॥ ३ ॥
यमिमं त्वं वृषाकपिं प्रियमिंद्राभिरक्षसि ।
श्वा न्वस्य जंभिषदपि कर्णे वराहयुर्विश्व० ॥ ४ ॥
प्रिया तष्टानि मे कपिर्व्यक्ता व्यदूदुषत् ।
शिरो न्वस्य राविषं न सुगं दुष्कृते भुवं विश्व० ॥ ५ ॥
न मत्स्त्री सुभसत्तरा न सुयाशुतरा भुवत् ।
न मत्प्रतिच्यवीयसी न सक्थ्युद्यमीयसी विश्व० ॥ ६ ॥
उवे अंब सुलाभिके यथेवांग भविष्यति ।
भसन्मे अंब सक्थि मे शिरो मे वीव हृष्यति विश्व० ॥ ७ ॥
किं सुबाहो स्वंगुरे पृथुष्टो पृथुजाघने ।
किं शूरपत्नि नस्त्वमभ्यमीषि वृषाकपिं विश्व० ॥ ८ ॥
अवीरामिव मामयं शरारुरभि मन्यते ।
उताहमस्मि वीरिणींद्रपत्नी मरुत्सखा विश्व० ॥ ९ ॥
संहोत्रं स्म पुरा नारी समनं वाव गच्छति ।

वेधा ऋतस्य वीरिणींद्रपत्नी महीयते विश्वं० ॥ १० ॥
इंद्राणीमासु नारिषु सुभगामहमश्रवं ।
नह्यस्या अपरं चन जरसा मरते पतिर्विश्वं० ॥ ११ ॥
नाहमिंद्राणि रारण सख्युर्वृषाकपेॠते ।
यस्येदमप्यं हविः प्रियं देवेषु गच्छति विश्वं० ॥ १२ ॥
वृषाकपायि रेवति सुपुत्र आदु सुस्नुषे ।
घसत्त इंद्र उक्षणः प्रियं काचित्करं हविर्विश्वं० ॥ १३ ॥
उक्ष्णो हि मे पंचदश साकं पचन्ति विंशतिं ।
उताहमद्मि पीव इदुभा कुक्षी पृणंति मे विश्वं० ॥ १४ ॥
वृषभो न तिग्मशृंगोन्तर्यूथेषु रोरुवत् ।
मंतस्त इंद्र शं हृदे यं ते सुनोति भावयुर्विश्वं० ॥ १५ ॥
न सेशे यस्य रंबतेंतरा सक्थ्या३ कपृत् ।
सेदीशे यस्य रोमशं निषेदुषो विजृंभते विश्वं ॥ १६ ॥
न सेशे यस्य रोमशं निषेदुषो विजृंभते ।
सेदीशे यस्य रंबतेंतरा सक्थ्या३ कपृद्विश्वं० ॥ १७ ॥
अयमिंद्र वृषाकपिः परस्वंतं हतं विदत् ।
असिं सूनां नवं चरुमादेधस्यान आचितं विश्वं० ॥ १८ ॥
अयमेमि विचाकशद्विचिन्वन्दासमार्यं ।
पिबामि पाकसुत्वनोभि धीरमचाकशं विश्वं० ॥ १९ ॥
धन्व च यत्कृंतत्रं च कतिस्वित्ता वि योजना ।
नेदीयसो वृषाकपेस्तमेहि गृहाँ उप विश्वं० ॥ २० ॥
पुनरेहि वृषाकपे सुविता कल्पयावहै ।

य एषः स्वप्ननंशनोस्तमेषि पथा पुनर्विश्वं० ॥ २१ ॥
यदुदंचो वृषाकपे गृहमिंद्राजगंतन ।
क१ स्य पुल्वघो मृगः कमगञ्जनयोपनो विश्वं० ॥ २२ ॥
पर्शुर्ह नाम मानवी साकं ससूव विंशतिं ।
भद्रं भल त्यस्या अभूद्यस्या उदरमामयद्विश्वं० ॥ ३२ ॥

There are twenty-three verses in the hymn; and of these 3, 4, 5 and 20, 21 and 22 have a direct bearing on the question we are discussing. But to understand these verses properly, it is necessary to discuss most of the other verses in the hymn, and I shall therefore examine the hymn verse by verse. I have already remarked that the hymn is one of those which have not yet been properly understood. Some of the verses have been explained by Yâska, but he has nowhere tried to give us the bearing of the whole story described in the hymn. Sâyaṇa's commentary is very often simply verbal, and in many places he too is not certain about the meaning, while the Anukramaṇî has been several times disregarded by Sâyaṇa himself. On the other hand, Ludwig, Grassmann, and several other European scholars have tried in their own way to explain the legend or the story embodied in the hymn, and the latest attempt of the kind is that of Piscel and Geldner in their Vedic studies, Vol. VII., Part I.* These scholars hold that the hymn narrates a legend current in old days. In other words, they take it, and I think rightly, to be a historic hymn. But the question, what does the legend signify, or how did it

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* I am indebted for this information to Dr. R. G. Bhândârkar, who kindly undertook to explain to me the views of German scholars on this point.

originate, still remains unsolved. Piscel and Geldner understand the hymn to mean that Vṛishâkapi went down to the south and again returned to the house of Indra. But even then the bearing of the legend is but imperfectly explained. The occurrence of such words as *dâsa*, *ârya* and *parshu* in the hymn have led some to suppose that the hymn records the story of a struggle between the Aryan and the non-Aryan races. But the hypothesis hardly explains the various incidents in the story, and the legend may therefore be said to be but still imperfectly understood. Under such circumstances any suggestion which explains the hymn better is at least entitled to a hearing. It is admitted that the hymn is a dialogue between Indra, Indrâṇî, and Vṛishâkapi, a son of Indra as they call him.* But there is a great divergence of opinion in assigning different verses to their deities. I shall examine these points while discussing the verses.

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* Kâtyâyana in his Sarvânukramaṇî says—वि हिऱ्यधिकैंद्रो वृषाकपिरिंद्राणींद्रश्च समूदिरे । Upon this the Vedârtha dîpikâ by Shaḍguru-shishya has,—वृषाकपिर्नामेंद्रस्य पुत्रः शचीसपत्न्यां जातः इंद्राणींद्रपत्नींद्रश्च स्वयमिति त्रयः समूदिरे सहत्येादिरे विवादं कृतवंतः । The verses of the hymn are then distributed amongst the speakers as follows :— Indra, 1, 8, 11, 12, 14, 19, 20 21, 22 ; Indrâṇî, 2, 3, 4, 5, 6, 9, 10, 15, 16, 17, 18; and Vṛishâkapi, 7, 13, 23. The same distribution is given in the Bṛihad-devatâ by Shaunaka. Piscel and Geldner introduce Vṛishâkapâyî in the dialogue and distribute the verses somewhat differently thus, Indra, 1, 3, 8, 12, 14, 19, 20 ; Indrâṇî 2, 4, 5, 6, 9, 16, 21 ; Vṛishâkapi 7, 10 13 ; and Vṛishâkapâyî, 11, 15, 17, 18. Verses 22 and 22 are supposed to be addressed by a stranger, the narrntor.

VERSE 1.—The verse has been differently interpreted by different writers. Yâska (13. 4.) interprets it as referring to the rays of the sun, which (the rays) deem themselves perfectly independent of the luminary by which they were sent out. Sâyaṇa ascribes it to Indra who says "that sacrificers, allowed by me to sacrifice to Vṛishâkapi, have disregarded me, but are praising the lord Vṛishâkapi who is delighted, as my friend, in the sacrifices, where plenty of Soma is used; [but notwithstanding] this Indra is superior to all." Mâdhava Bhaṭṭa, whom Sâyaṇa mentions with respect, however, thinks otherwise. He considers that the verse is addressed by Indrâṇî to Indra, when she perceived that the sacrificers have ceased to sacrifice on account of the oblations being spoiled by an animal representing Vṛishâkapi. He would, therefore, thus interpret the verse. Says Indrâṇî, "In places of plenty where lord Vṛishâkapi revels, sacrificers have give up sacrificing and disregarded Indra. My friend Indra is superior to all."

When the very first verse is thus interpreted in three different ways, one can easily attribute the difference to an imperfect perception of the bearing of the whole hymn. To me Mâdhava Bhaṭṭa alone appears to have taken into consideration the verses that follow. Thus the fifth verse of the hymn states that the things of Indrâṇî were spoilt by Vṛishâkapi in the form of an animal, and consequently he was beheaded. I should, however, like to refer to verse 21, wherein Vṛishâkapi is told that when he appears again, sacrifices would be performed. This evidently implies that they were stopped before and were to be commenced again on the re-appearance of Vṛishâkapi. The first verse therefore must be interpreted to mean that "the sacrifices are stopped." The root *sṛij* with *vi* may mean either to abandon

or to allow, but the former is its natural meaning, and when verse 21 in the same hymn can be easily explained by taking the former meaning of *sṛij* with *vi*, it would be straining the words if we put a different interpretation on them. I am, therefore, disposed to interpret the verse after the manner of Mâdhava Bhaṭṭa, except the last sentence.

But why should sacrifices be stopped? What has Vṛishâkapi to do with them? These are very important questions, and I am sure that had they been properly answered, there would have been no difficulty in interpreting the hymn. In verse 3 we are told that Vṛishâkapi spoken of in this hymn, has the form of a yellow antelope. In verse 5 Indrâṇi is prepared to cut off his head, because he offended her, and in the preceding verse (4th) a dog is said to be let loose upon him. These facts—an antelope with the head cut off, and a dog closely following him—are quite sufficient for the purposes of identification. They shew that the whole story is based upon the "antelope's head" we have previously discussed; and had Yâska and Sâyaṇa known that there is a constellation called dog in the heavens by the side of Mṛigashiras, I feel certain that they would not have hesitated to recognize in Vṛishâkapi, the sun as represented by the constellation of Orion. But all traces of the dog, as a constellation, having been lost in the Sanskrit literature, neither Yâska nor Sâyaṇa could find any clue to the true meaning of the hymn. This is not, however, the only place where Yâska has been obliged to invent extraordinary interpretations. Not knowing that the dog represented a star, he has proposed (Nirukta 5. 20), that *Vṛika* should be understood to mean "the moon," while usually it means a wolf or a wild dog, and it appears to

me that a similar mistake has been also committed here. Comparative Mythology and Greek Astronomy have, however, thrown further light on the subject, and we must now try to interpret the hymn accordingly. Vṛishâkapi must, therefore, be taken to represent the sun in Orion.

But even supposing that Vṛishâkapi thus represents the sun in Orion, why should the sacrifices be stopped on his account? The identification of Vṛishâkapi with Orion at once furnishes us with a solution of this question. We have already seen that the dog is said to commence the new year in Rig i. 161. 13; and since Canis and Orion are close to each other, Orion may also be said to have commenced the year. The Devayâna, therefore, extended in those days from the heliacal to the acronycal rising of Orion; that is, when Orion rose with the sun, it was the vernal equinox, the beginning of the Devayâna, and six months after, when it rose at the beginning of night, it was the autumnal equinox, the end of the Devayâna. Now all *Deva*-ceremonies and sacrifices could be begun and performed only during the Devayâna,* or, as we find it in later traditions, only in the Uttarâyaṇa. The acronycal rising of Orion was thus a signal to stop such ceremonies, and oblations could properly be said to have been spoilt by the appearance of this constellation at the beginning of night.† But above all the burden of the song "Indra is *uttara* of all," becomes specially appropriate in this case. The word *uttara*

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* Jaimini Mim. Dar. vi. 8. 23, and other authorities cited in Chap. II.

† If Vṛitra is correctly identified with the constellation of Mṛigashiras, we may on the same theory also explain why he is called *Makhasyu* in Rig. x. 73. 7. The appearance of Mṛiga, at the beginning of night, indicated the commencement of the Dakshiṇâyana when sacrifices were stopped. Vṛitra *alias* Mṛiga might thus come to be regarded as a destroyer of the sacrifices.

does not here mean superior, but "upper" implying that Indra is in the upper or the northern portion of the universe, though the sun or Vṛishâkapi may go down. I would therefore translate the first verse thus:—"Where my friend Vṛishâkapi rejoiced in the wealth of the Aryans, they gave up sacrificing and did not respect Indra. Indra is (however) in the upper (*i. e.*, northern) part of the universe."*

VERSE 2.—Indra is here reproached for following up Vṛishâkapi, though he has offended Indrâṇî. Says she to Indra: "O Indra! (how is it that) you run down fast after Vṛishâkapi and do not go anywhere else to drink soma. Indra is, &c."

The word *parâ* in this verse seems to denote the region where Vṛishâkapi has gone. *Parâvat* is often said to be the place in the distant or lower portion of the sphere, and is thus contrasted with *arvâvat* (Rig. viii. 13. 15). In Rig. viii. 33. 10 Indra is said to be Vṛishâ in the *parâvat* and also in the *arvâvat* regions. Indra is again very often spoken of as going to distant regions to see whether Vṛitra is duly killed. The same fact appears to be here expressed in a different form.

VERSE 3.—Sâyaṇa following the Anukramaṇî, understands the verse as addressed by Indrâṇî to Indra. Ludwig and Grassmann, on the other hand, take it to be addressed by Indra to Indrâṇî: and this construction seems better than that of Sâyaṇa. It may, however, be here, once for all, remarked that though scholars thus differ in assigning verses to different deities, yet it does not, on the whole, materially alter the legend incorporated in the hymn.

* If Vṛishâkapâyî is to be at all introduced in the dialogue, we may assign this verse to her. The phrases, "my friend" and "did not respect Indra." would be more appropriate in her mouth than in that of Indra or Indrâṇî.

Says Indra: " What has this Vṛishâkapi, in the form of a yellow antelope, done to thee that you are so much angry with him? Was it the rich possession (wealth) of the Aryans? Indra, &c. "

The form, in which Vṛishâkapi is here said to have appeared, should be specially noted. *Harita* means yellow, and yellow animals (*Haritah*) are said to be yoked to the carriage of Âditya in Nighaṇṭu (1. 15). There the word is, however, understood to be the plural of *Harit*, by the commentators in conformity to Rig. i. 115. 3 and v. 45. 9, where the sun is said to have seven horses yoked to his carriage. But I think that the same idea may give rise to the conception that the sun is represented by a single yellow animal, and we may take the passage in the Nighaṇṭu as referring also to the verse under consideration. I have previously alluded to the fact that the dog at the Chinvat bridge in the Parsi traditions is described as *zaritem*, that is, of the same colour as the antelope in the third verse. But the question of colour cannot be taken as finally settled until we first definitely decide what animal is represented by Mṛiga.*

VERSES 4 & 5.—Sâyaṇa is literally correct, but again misses the spirit, or rather has missed it throughout the hymn. Indra was reproached in the second verse for his partiality or over-kindness to Vṛishâkapi. But Indrâṇî was not satisfied with it, and if Indra failed to punish the Kapi, she took the matter in her own hand. Says she: " O Indra! as you (thus) protect this (your) favourite Vṛishâkapi, let the dog, eager (to chase) a hog (*varâha*), bite him at his ear. The Kapi spoilt my favourite things. † I shall, there-

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* See Dr. Rajendralal's Indo-Aryans, Vol. II., p. 303.

† The word in the original is *tashtani*, which literally means made, shaped, &c. Mâdhava Bhaṭṭa understands it to mean

fore, cut off his head, in order that an evil-doer may not enjoy happiness. Indra is in the upper (portion) of the universe." Here Indrâṇî is herself prepared to punish Vṛishâkapi by setting the dog at his ear, and cutting off his head. I have in a previous chapter shown how the figure of Mṛiga's head is to be obtained in the sky. Taking the three stars in the belt of Orion as the top of the head, the dog is close by the right ear of Mṛiga and may properly be said to bite it. The word *varâha* also points out the place where we may expect to find the dog. In Rig. i. 61. 7, *varâha** is said to be killed by Vishṇu beyond a mountain, which, in all probability, is the same story as that of Indra killing Vṛitra. A dog chasing *varâha* is therefore no other than Canis Major following the constellation of Orion, or the "antelope's head" representing Vṛitra. Sâyaṇa and Yâska and even European scholars are silent as to who this dog is. The verses, in fact, may be said to have remained altogether unexplained hitherto, though the words themselves are simple enough and have caused no difficulty.

VERSE 6.—This verse presents no difficulty. Thus satisfied, Indrâṇî speaks of herself as the best of women, best in every way.

VERSES 7 & 8.—Indra now tries to conciliate her. Sâyaṇa, following the Anukramaṇî, supposes that the seventh verse is addressed by Vṛishâkapi and the eighth by Indra. The only reason I can find for such an interpretation is the

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oblations offered to Indrâṇî. I translate it by things generally. Whatever meaning we may adopt, it is quite evident that the Kapi's interfering with them has offended Indrâṇî.

* In Rig. x. 99. 6, Indra is said to have killed Trishirshan, and with his aid Trita killed *varâha*.

occurrence of the word *ambâ*, which means "mother," and this cannot be supposed to be used by Indra. But though we avoid one difficulty in this way, we are launched into another, for the verse speaks of Indrâṇî being pleasing "to me;" and if Vṛishâkapi is the speaker "me," cannot refer to him, as Indrâṇî is his mother and, consequently, "me" has to be interpreted to mean "my father," and this Sâyaṇa has done. I prefer taking *ambâ* as an affectionate and respectful mode of address, as in modern Sanskrit, and the verse presents no difficulty. We can then take both the 7th and the 8th verse together and give them a natural interpretation. I translate thus "O auspicious lady! what you say is true . . . . . . you are pleasing to me . . But oh! hero-wife, with beautiful arms, pretty figure, profuse hair, and broad hips, why should you be so angry with our Vṛishâkapi? Indra is in the upper (part) of the universe."

VERSE 9.—Indrâṇî replies, "This mischievous (Vṛishâkapi) considers me to be *avîrâ* (*i. e.*, without a brave husband or son), while I am the wife of Indra, the mother of the brave, and the friend of Maruts. Indra, &c."

VERSES 10 & 11.—Pischel and Geldner suppose that the first is addressed by Vṛishâkapi to Indrâṇi, and the second by Vṛishakapâyî. Sâyaṇa understands them to be addressed by Indra. Whichsoever construction we adopt, the meaning remains the same. Indrâṇî is here told that she is highly respected everywhere; she is the blessed of all women, and that her husband never suffers from old age. This is obviously intended to pacify her.

VERSE 12.—Indra says "O Indrâṇî! I am not delighted without my friend Vṛishâkapi, of whom these favourite

watery oblations reach the gods. Indra is in the upper (part) of the universe."

VERSE 13.—This seems to be also addressed by Indra to Indrâṇî, who is here called Vṛishâkapâyi. This latter name has caused a difference of opinion, some considering Vṛishâkapâyî to be the mother, some the wife of Vṛishâkapi.* I do not see how the wife of Vṛishâkapi, as such, could be introduced in the song, unless Vṛishâkapi is understood to be the name of Indra himself. Commentators, who take Vṛishâkapâyî to mean the wife of Vṛishâkapi, accordingly adopt the latter view. Pischel and Geldner think that the verse is addressed by Vṛishâkapi to his wife Vṛishâkapâyî. The verse means, "O rich Vṛishâkapâyî! having a good son and a daughter-in-law, let Indra swallow the bulls, your favourite and delightful oblation. Indra, &c." There has been much speculation as to who could be the son and the daughter-in-law of Vṛishâkapâyi. But if Vṛishâkapâyî be understood to mean the wife of Indra, it causes no such difficulty. The adjectives "having a good son," &c., are simply complimentary, corresponding to the statement of Indrâṇî, that she was the "mother of the brave" in verse 9. Indra accepting her statements, asks her to allow him to swallow the watery oblations said to come from Vṛishâkapi in the last verse. The words *priyam* and *havis* are the same in both the verses; and I think that both of them refer to the same oblations.

VERSE 14.—Indra, satisfied with the prospect of getting the oblations, describes his appetite: "Twenty and fifteen oxen are being cooked for me; I shall eat them and be fat. Both the sides of my belly will be filled up. Indra, &c."

* See Max Müller's Lectures on the Science of Language, Vol. II., 538.

The practice of sacrificing bulls to Indra seems to have been out of date even at the time of the Rigveda (cf. i. 164. 43, where it is said to be an old custom). But the old custom could not be entirely forgotten, and if real bulls were not offered to Indra, poets supposed that clouds or stars might answer the same purpose. The number 35 mentioned in the verse may thus refer to the Nakshatras (28), and planets (7). But this explanation is doubtful and I cannot suggest a better one.

VERES 15, 16 & 17.—The fifteenth and the sixteenth seem to be addressed to Indra by Indrâṇî, and the seventeenth to Indrâṇî by Indra. In the fifteenth Indrâṇî, according to Sâyâṇa, asked Indra to sport with her just as a bull, with pointed horns, roars amongst a number of cows. The next two verses do not appear to be relevant to our purpose. We may therefore pass these over, and resume the thread of the story. Pischel and Geldner suppose that the 17th and 18th verses are addressed by Vṛishakapâyî.

VERSES 18 & 19.—Indrâṇî is now conciliated, and says that she has not killed Vṛishâkapi but some one else. The verse thus means, "O Indra! let Vṛishâkapi get the slain animal—an animal which was quite different from Vṛishâkapi's. Let him at once have a knife, a fire-place, a new vessel, and a cart-load of firewood (to cook the killed animal). Indra, &c." Thus by the intercession of Indra, Indrâṇi was moved, and at last undid or rather explained away her previous act of decapitation. Pischel and Geldner translate the verse very nearly as I have done. They, however, consider it to be addressed by Vṛishâkapyî and translate *parasvantam* by 'wild.' This does not explain what dead animal is here referred to. It is, I think, more natural to suppose that the

dead animal here spoken of is the same as that described in verse 5, and one whose head Indrâṇî is there said to be ready to cut off. Indrâṇî now says that this dead animal should be given to Vṛishâkapi, especially as Indra has already got his oblations of bulls. I have already shown that there were several legends about the "antelope's head." It seems that Indrâṇî, referring to some of them, assures Indra that it was not Vṛishâkapi in the form of the antelope which she killed, but some one else (literally *parasvantam* = representing another than Vṛishakapi, as Sâyaṇa takes it.) Thereon Indra, having thus saved Vṛishâkapi by his intercession, observes, "Thus do I go seeing and discriminating between a *dâsa* and an *ârya* ; I take my drink from those that prepare Soma juice and cook the oblations, and thus behold or protect the intelligent sacrificers." In another word, Indra is glad that he has saved an Ârya, and triumphantly declares that he is always careful to distinguish between an Ârya and a Dâsa, the latter of whom he would punish and kill, *e. g.*, Vṛitra, who is said to be a Dâsa. Vṛihâkapi being thus saved Indra, in the following verses, bids him a farewell, wishing for a safe journey and speedy return. These verses are very important for our present purpose, and I shall therefore examine them singly.

VERSE 20—In this verse Indra asks Vṛishâkapi to go to his house (*astam*) and then return afterwards to the house (*grihas*) of Indra. But the question is where is Vṛishâkapi's house and where is that of Indra ? The words in the original are *dhanva*, *kṛintatra* and *nedîyas*. Vṛishâkapi is asked to go to *dhanva*, which is also *kṛintatra*. Sâyaṇa takes *dhanva* to mean a desert and *kṛintatra* in the sense that "the trees therein are cut off." But this meaning

does not quite suit the context. What is meant by saying that Vrishkapi, who is admittedly the sun in a different form, should go to a forest? Where is that forest, and what does it imply? *Dhanva* is a word that occurs several times in the Rigveda. In Rig. i. 35. 8 it is said to consist of three *yojanas* and is contrasted with the earth. Sâyaṇa there understands it to mean "sky or heavens;" and I see no reason why we should not interpret the word in the same way in this verse. *Dhanva* therefore means "sky" or "heavens." But is it the vault above with three stages? No, the poet qualifies the idea by *kṛintatra*, meaning "cut off." It is thus evidently the portion of the heavens which is cut off. In other words, the idea here denoted is the same as that expressed by the phrase *avarodhanam divaḥ*—"where heavens are closed," or "where the view is obstructed," in Rig. ix. 113. 8. *Dhanva*, which is *kṛitantṛa*,* thus denotes the innermost part of the celestial sphere, the southern hemisphere or the Pitṛiyâna. The poet knows that the vault of the heavens above him has three halts or stages which Vishṇu is said to have used as his three steps (Rig. i. 22. 17). But of the *nether* world the poet has no definite knowledge, and he therefore cannot specify the *yojanas* or the stages it contains. Thus he simply says that there are *some yojanas* therein. The first part of the verse may now be translated thus: O Vṛishâkapi! go to the house (in) the celestial sphere which is cut off and which contains some *yojanas* or stages." In short, Indra means that Vṛishâkapi should now descend into the southern hemispere.

* The only other place where *krintatra* is used in the Rigveda is v. 27. 13, which Yâska and Sâyaṇa both interpret to mean that "waters come up from *krintatra i. e.,* a cloud." But it may be as well asked if *krintatrât* cannot here mean "from below."

The latter part of the verse literally means "and come to our house from *nedîyas*." Now *nedîyas* is again a word which neither Yâska nor Sâyaṇa seem to have properly understood. Pâṇini (v. 3. 63) tells us that *nedîyas* is the comparative of *antika*. Now *nedîyas* cannot possibly be derived from *antika* by any change in the form of the latter word. Pâṇini therefore considers *neda* to be a substitute for *antika*, when the comparative form is to be derived. This is equivalent to saying that 'bet' is to be substituted for 'good' in deriving the comparative form of 'good' in English. I need not say how far such an explanation would be regarded satisfactory. My own view is that *nedîyas* had lost its positive form in the times of Pâṇini, or perhaps its positive form was never in use like that of 'superior' in English. But Pâṇini, who, as a grammarian, felt bound to account for all the forms, connected *nedîyas* with *antika*, probably because the ordinary meaning of *nedîyas* in his time was the same as that of the comparative form of *antika*. But we cannot infer from this that *nedîyas* might not have meant anything else in the days of Pâṇini. Paṇini might have taken into account only the most ordinary sense of the word, and finding that a positive form was wanting connected it with the word which expressed the ordinary meaning in the positive form. The fact that Pâṇini considers *nedîyas* as the comparative of *antika* does not therefore preclude us from assuming, if we have other grounds to do so, that *nedîyas* originally meant something else *in addition* to its present sense; for Pâṇini speaks of the *form* and not of the meaning of *nedîyas*. Having thus shown that the authority of Pâṇini is not against me, I shall now give my meaning of *nedîyas*. I think it means lower, being akin to *neath, beneath, nether** and corres-

* Bopp derives O. H. G. *nidar* from Sk. *ni* down, and disapproves Grimm's suggestion that it should be traced to a Gothic

ponding words in other languages. The suggestion, I know, will be received by some with surprise and suspicion, and I must give my grounds for proposing a new meaning. There is no passage in the Rigveda where the use of *nedîyas* might be considered as definitely deciding its meaning. In Rig. v. 52. 6, viii. 26. 10 and x. 101. 3, *nedishṭha* or *nedîyas* might be supposed to mean lowest or lower. But the passages are not conclusive on this point, as the word there used might also be understood to mean 'nearest,' 'nearer,' according to Pâṇini. In the Brâhmaṇas we, however, meet with more decisive passages. Thus in the Aitareya Brâhmaṇa vi. 27 *nedîyas* is contrased with *uparishṭhat.** Böhtlingk and Roth give a passage from the Kâṭhaka recension of Yajurveda (28. 4), which says, "he ascends (*ârohati*) to the heavens from the *nethiṣṭha* world."† Here the word 'ascend' clearly shows that the *netishṭha* world must be understood to mean the 'lowest world,' 'world at the bottom.' In the Tâṇḍya Brâhmana (iii. 4, 2, 13, 2) there occurs a passage where the directions for lowering

verb *nithan*, *nath*, *nethum*, and divided as *nid-ar*, *ar* being a comparative termination. (Bopp, Com. Gr. Eng. Tr. 1860, Vol. I., p 382). K. Brugmann compares Sk. *nediyas* with Av. *nazd-yah* meaning 'nearer,' and derives the words from *nazd* (*ni* down and *sed* to sit). Cf. Sk. *nîda* Lat. *nidu*, O. Ir. *net*, O. H. G. *nest* = a resting place (Comp. Gr. i., § 591, ii. §§ 4, 135). Both Bopp and Brugmann do not propose any new meaning of *nediyas*. But it is evident that whichsoever derivation we adopt the word is connected with *ni* down, and if we find passages in the Brâhmaṇas where it is contrasted with *upari-shṭât*, we can, I think, safely understand *nediyas* to mean 'lower' as suggested by its etymology; 'nearer' is a secondary meaning.

* उपरिष्टान्नेदीयसि भागे Ait. Br. vi. 27.

† नेदिष्ठादेव स्वर्गलोकमारोहति । Kâthak, 28. 4.

the tone are given as follows :—"Just as after creeping up to the top of a high tree (a man) gradually comes lower and lower so, &c."* The word for lowering in the text in *nedîyas sankramât*, and there is no possibility of mistaking its meaning. In the Tâṇḍya Brâhmaṇa ii. 1. 3 the raising of the tone is described as ascending from top to top (*agrât agram*); and *nedîyas sankrama* must, therefore, mean a gradual lowering of the voice. In fact, *nedîyas sankrama* represents the same idea as *low-er-ing*, that is, not taking a sudden leap down but descending from the highest point to the next lower, and so on. In all these places Sâyaṇa explains *nedîyas* as meaning 'nearer' according to Pâṇini; but in every case he has to strain the words to suit the context. It was not, however, Sâyaṇa's fault ; for after *nedîyas* was once assigned to *antika*, all traces of its old meaning were naturally lost, and none dared to question Pâṇini's authority. But we now know that in other languages *neath* means low, and in several passages in the Brâhmaṇas, we find *nedîyas* contrasted with 'upper' or 'top.' This, in my opinion, is sufficient to prove that *nedîyas* meant lower in the Vedic times. I have already shown that the authority of Pâṇini is not against understanding the word in this way. All that he has laid down is that *nedîyas* having no positive form should be derived from *antika* without saying whether *nedîyas* was or was not used in any other sense. I am therefore inclined to think that *nedîyas* might have had more than one meaning even in Pâṇini's time, but he took the most ordinary meaning and derived the comparative form from *antika*. This is course

* यथा महावृक्षस्याग्रं सृत्वा नेदीयः संक्रमात् संक्रामत्येवमेतन्नेदीयः संक्रमया नेदीयः संक्रमात् संक्रामति । Tân. Br. iii. 4. 2.

of time served in its turn to restrict the denotation of the word only to one meaning, *viz.*, 'nearer.'

I would therefore translate the verse thus, "O Vṛishâkapi ! go to the house—the celestial sphere which is cut off and which contains some (unknown) *yojanas* or stages. From your *nether* house come to our house. Indra is in the upper (portion) of the universe." *Nedîyas* is thus contrasted with *uttara* in the burden of the song. Both are comparative forms. Indra is in the *uttara* (upper) regions, while Vṛishâkapi is going to the *nedîyas* (lower) world ; and Indra expects or rather requests Vṛishâkapi to come back again to his (Indra's) house. That is the gist of the whole verse. The idea that the sun *falls* down from the autumnal equinox is an old one. In Ait. Br. iii. 18 and in Taitt. Br. i. 5. 12. 1 the ceremonies on on the Vişûvân or the equinoctial day in a *satra* are described, and there we are told that "gods were afraid of the sun *falling down* from the sky and so supported him," and being thus supported he "became *uttara* to all." The Ait. Br. iii. 18 has thus the same word *uttara* that we have in this verse, and it is natural to suppose that both relate to the same subject. I have also quoted a passage from the Aitareya Brâhmaṇa where *nedîyas* is contrasted with *uparishṭât.* From these I infer that the verse, we are now considering, describes the descent of the sun into the southern or the lower hemisphere, and that Indra asks him to come back again to the house of Gods, *i.e.*, the northern hemisphere. I have already given in full my reasons for understanding *nedîyas* in a differeht sense. But I may remark that, even accepting the common meaning of the word, the verse may still be interpreted in the way I have suggested.

VERSE 21.—Vṛishâkapi has gone down to the nether

world. This verse now describes what Indra will do when he returns. Says Indra, "O Vṛishâkapi! you, the destroyer of sleep, who are going to the house, come back again, again by (your) way. We would perform the sacrifices. Indra, &c." The verse thus distinctly refers to the recommencement of the sacrifices in the Devayana or the Uttarâyaṇa as understod in old days. The word *suvitâ* is from the same root as *vâitanika* and *kalpyâvahai* is from *kṛip*, the root which gives us the word *kalpa* in *kalpasûtras*. *Savita kalpayâvahai* thus means "we would perform the *vaitânika* ceremonies," which, as described in the first verse, were stopped when the sun went down to the neither world I may also here point out that the house in the nether world or, as Sayaṇa interprets it, the house of the enemy is called *asta* literally 'thrown,' while Indra's house is called *gṛiha*. The sun goes down to the *asta* and returns up to the *gṛiha* of Indra. This verse, in sofar as it speaks of the recommencement of sacrificial ceremonies, confirms the interpretation I have proposed for the preceding verse.

VERSE 22.—This is the most important verse in the whole hymn. It describes the circumstances under which Vṛiṣhâkapi will return to Indra's house. Literally rendered it means, "O mighty Vṛiṣhâkapi!* when you rising up-

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* Pischel and Geldner suppose that the verse is addressed by a third person to Vṛisâkapi and Indra, probably because both these names occur in the vocative case and the verb is in plural. In that case the verse would mean, "When Indra and Vṛishâkapi would both be in the house. where would the sinning Mṛiga be, &c.?" This interpretation does not, however, make any change in the part of the verse material for our purpose. For whichsoever construction we adopt the question still remains—why is the Mṛiga invisible when both Indra and Vṛishâkapi are together?

wards (or rather northwards) would come to (our) house, where would that great sinner Mṛiga be? Where he, who misleads people, would go? Indra, &c." Now Yâska, in whose days all traces of Canis being once a star in the heavens were lost, could not understand what to make of the statement "where would that great sinner Mṛiga be?" It means that Mṛiga would not be seen, would not be visible, when Vṛishâkapi goes to the house of Indra; but Yâska did not perceive what was intended by such a statement. He could not conceive that the constellation of Mṛigashiras would be invisible, when the sun in his upward march would be there at the beginning of the Devayâna, that is, when he comes to the house of Indra, and therefore he proposed to interpret *Mṛiga* in the sense of "the sun" (Nirukta 13. 3). Mṛiga, says he, is derived from *mṛij* to go, and means "going," "one who goes and goes and never stops,' in other words, "the sun." Now, says his commentator, when a person goes into a house he cannot be seen by the outsiders. So Vṛishâkapi, when he goes to the house, cannot be seen by the people on the earth! I do not think that I need point out the highly artificial and inconsistent character of this explanation. The word Mṛiga, so far as I know, is no where used in the Rigveda in this sense. Again, if the word Mṛiga in the third verse of this hymn is to be understood as meaning an antelope, is it not natural enough to suppose that the same Mṛiga is referred to in this verse? Then, again, how can the sun be said to become invisible to the people when he is in the house of gods? Nor can he be invisible to Indra whose house he enters. What can, in such a case, be the propriety of the word *udancha* or "rising upwards"? If Mṛiga means the sun according to Yâska, we shall have to suppose that the

rising sun was *invisible*, a clear contradiction in terms. I am sure Yâska, here, tried to explain away the difficulty in the same way as he has done in the case of *Vṛika*. But, in the present instance, the solution he has proposed is, on the face of it, highly inconsistent. so much so that even Sâyaṇa, does not follow it. Sâyaṇa, however, has nothing else to propose, and he quietly leaves the word Mṛiga as it is and unexplained in his commentary. In short, both Sâyaṇa and Yâska have found the verse too difficult to explain. The meaning I have proposed explains the verse in a natural and a simple manner, and further corroborates the statement in the Rigveda previously referred to *viz.*, "Canis awakened the Ṛibhus at the end of the year." In the Taittirîya Brâhmaṇa i. 5. 2. 1, we are told that the Vedic priests, *e g.*, Mâtsoni, observed the position of the sun amongst stars in the morning, and, as the Nakshatras disappear when the sun rises, they determined the position by observing what Nakshatra rose a little before the sun. The present verse records an observation to make which no greater skill is required. It tells us that when Vṛishâkapi went to the house of Indra his Mṛiga was not visible anywhere, thus clearly indicating that sun rose with Orion on that day. The word *udancha* is especially remarkable in this case. The sun must be *udancha* when he goes to the house of Indra, which, the burden of the song tells us, is in the northern or the upper part of the universe This verse, therefore, clearly describes not merely the *rising* sun, but the position of the rising sun amongst the constellations when he is at the vernal equinox, the entrance of the house of gods or the house of Indra. Sâyaṇa and Yâska have completely missed this point, and have made Vṛishâkapi represent the rising sun as an unnecessary rival to Savitâ

(Nirukta 12. 12). If the meaning I have proposed is correct, we have here a record of the position of the sun at the vernal equinox. I take *pulvaghas* in the original to mean "great sinner;" but it may be translated as Yâska proposes by "omnivorous" or "voracious." But in either case I would take it as referring to the antelope's spoiling the things of Indrâṇi. The point is that the sinning Mṛiga would not be with Vṛishâkapi when he again goes to the house of Indra, and Indrâṇi would have no cause to complain of the presence of the odious Mṛiga at the time.

Verse 23.—Sâyaṇa translates, "O arrow! Manu's daughter, named Parshu, gave birth to twenty (sons) together. Let her whose belly was big be happy! Indra is in the upper (portion) of the universe." I cannot, however, understand what it means. Parshu, according to Sâyaṇa, is a Mṛigî or a female antelope. But why address the arrow to give happiness to her? Can it have any reference to the arrow with which Orion was killed? Then who are these twenty sons? Are they the same as twenty mentioned in verse 14? Is it likely that twenty alone are mentioned leaving the additional fifteen to be understood from the context? The concluding verse undoubtedly appears to be benedictory. But I have not found a satisfactory solution of the above questions. Perhaps *bhala* meaning 'auspicious,' may be used for Vṛishâkapi, and Indra addressing him pronounces benediction on the female that gave birth to the yellow antelope and several other stars that are supposed to be either killed or swallowed by Indra in this hymn. But I cannot speak with certainty on the point and must leave the verse as it is.

Now let us see what are the leading features of the story of Vṛishâkapi and what they signify. We have seen

that scholars differ in assigning the verses of the hymn to the different speakers, and here and there we meet with expressions and words which cannot be said to be yet satisfactorily explained. Some of the interpretations I have proposed may not again be acceptable to all. But these difficulties do not prevent us from determining the leading incidents in the legend, which may therefore be summarised somewhat as follows. Vṛishâkapi is a Mṛiga, and sacrifices are stopped where he revels. He is, however, a favourite of Indra, and consequently the latter, instead of punishing, follows him. Indrâṇî, who has herself been offended by the Kapi, now reproaches Indra for his overfondness for the animal and threatens to punish the beast by cutting off his head and letting loose a dog at his ear. Indra intercedes and Indrâṇî assures him that the punishment has not been inflicted on his favorite beast, but on someone else. Vṛishâkapi is now going down to his house and Indra, in bidding farewell to his friend, asks him to come up again to his (Indra's) house, so that the sacrifices may be recommenced; and, strange to say, that when Vṛishâkapi returns, in his upward march to the house of Indra, the impertinent Mṛiga is no longer to be seen! Vṛishâkapi, Indra and Indrâṇî thus finally meet in the same house, without the offensive beast, and the hymn therefore concludes with a benedictory verse.

There can be little doubt that the hymn gives a legend current in old Vedic days. But no explanation has yet been suggested, which accounts for all the incidents in the story or explains how it originated. Vṛishâkapi is a Mṛiga, and his appearance and disappearance mark the cessation and the recommencement of the sacrifices. The Indian tradition identifies him with the sun in one form or another and

comparison with Greek *Erikapaeos* points to the same conclusion. Our Vṛishâkapi or Mṛiga must again be such as is liable to be conceived in the form of a head cut off from the body, and closely followed by a dog at its ear, unless we are prepared to treat the very *specific* threat of Indrâṇi as meaningless except a *general* threat. All these incidents are plainly and intelligibly explained by taking Vṛishâkapi to represent the sun at the autumnal equinox, when the Dog-star or Orion commenced the equinoctial year; and, above all, we can now well understand why Vṛishâkapi's house is said to be low in the south and how his Mṛiga disappears when he goes to the house of Indra—a point which has been a hard knot for the commentators to solve. I, therefore, conclude that the hymn gives us not only a description of the constellation of Orion and Canis (verses 4 and 5), but clearly and expressly defines the position of the sun when he passed to the north of the equator in old times (verse 22); and joined with the legend of the Ṛibhus we have here unmistakeable and reliable internal evidence of the hymns of the Rigveda to ascertain the period when the traditions incorporated in these hymns were first framed and conceived. In the face of these facts it is impossible to hold that the passages in the Taittirîya Sanhitâ and the Brâhmaṇas do not record a real tradition about the older beginning of the year.

CHAPTER VIII.

CONCLUSION.

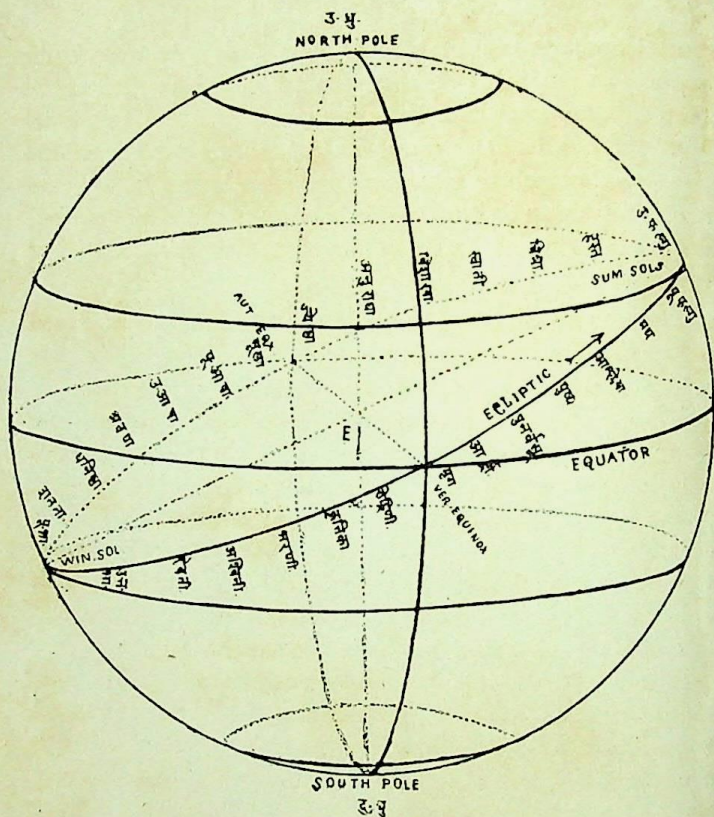
Results of previous chapters—Winter solstice in Phâlguna and Mâgha—Successive year-beginnings in old times stated and explained—The second traditional year-beginning in the Taittirîya Sanhitâ—Winter solstice in Chaitra and vernal equinox in Punarvasû—Vedic traditions corroborating the same—The commencement of the sacrifice with Aditi, the presiding deity of Punarvasû—The Abhijit day—The asterismal Prajâpati with Chitrâ for his head—The Conclusions—Periods of ancient Vedic literature stated and described—The Pre-Orion Period, 6000—4000 B. C.—The Orion Period, 4000—2500 B. C. The Kṛittikâ Period, 2500—1400 B. C.—Pre Buddistic Period, 1400—500 B. C.—Not inconsistent with the results of Comparative Philology or Mythology—Rate of the precession of the equinoxes—Correctly determined by the Hindus—Continuous record of the different positions of the equinoxes in Sanskrit literature—Traditions based upon the same—Prajâpati, Rohiṇî and Rudra—Meaning of Rohiṇî—The Kṛittikâs in the Taittirîya Sanhitâ and Vedânga Jyotisha—The equinox in Ashvinî in later works.—Story of Vishvâmitra—Notices of the recession of the rainy season from Bhâdrapada to Jyeshṭha Conclusions shewn to be consistent with the traditions regarding the antiquity of Zoroaster and the Vedas.

We have thus traced back one of the traditions about the old beginnings of the year, mentioned in the Taittirîya Sanhitâ, to the oldest of the Vedic works, and what is still more important, shown that the Vedic traditions are in this respect completely corroborated by the oldest records and traditions of the other two sections of the Aryan race—the Parsis and the Greeks. The traditions of each nation taken singly may not be conclusive, but when, putting all these together, and interpreting one set in the light of another, we find that directly or indirectly all point to the same conclusion, their cumulative effect cannot but be

conclusive. Scholars have already discovered the similarity between the traditions of the three nations; but without any clue to the period when all the Aryas lived together, it was impossible to reduce all these traditions into a harmonious whole. The traditions of Orion, and especially its position at the beginning of the equinoctial year, do, however, supply such a clue, and with its help the mystery about the oldest periods of Aryan civilization is considerably cleared up. Thus if Orion is now no longer a hunter of unknown parentage, we need not also indulge in uncertain speculations about the foamy weapon with which Indra killed his enemy, or how the four-eyed dogs came to be stationed at the Chinvat Bridge, or why the Ṛibhus are said to be awakened by a dog at the end of the year.

Astronomically the matter is as simple as it could be. All our measurements of time are directly based upon the changes in the positions of heavenly bodies. But there is no measurement of time, at present determined, which is longer than the period during which the equinoxes complete their revolution in the ecliptic. It is, therefore, the best measurement of time for determining the periods of antiquity, only if we have reliable records about the position of heavenly bodies in early days. Fortunately, such records of the time, when the Hellenic, the Iranian and the Indian Aryans lived tegether, have been preserved for us in the Rigveda, and with the help of the Greek and Parsi traditions we can now decipher these records inscribed on the specially cultivated memory of the Indian Aryans. Commencing with the passages in the Taittirîya Sanhitâ and the Brâhmaṇas, which declare that the Phalguni full-moon was once the new-year's night, we found that Mṛiga-

shiras was designated by a name which, if rightly interpreted, showed that the vernal equinox coincided with that asterism in old times. This was, so to speak, a sort of corroborative evidence of the truth of the statement in the Taittirîya Sanhitâ. A reference to the figure will show at a glance that if the sun be at the winter solstice on the Phalgunî full moon day, the moon to be full must be diametrically opposite to the sun and also near Phalgunî. Uttarâ Phalgunî will thus be at the summer solstice and the vernal equinox will coincide with Mṛigashiras. With the solstice in Mâgha, the equinox will be in the Kṛittikâs ; while when the Uttarâyaṇa begins in Pausha the equinox is in Ashvinî. Ashvinî and Pausha, Kṛittikâs and Mâgha, and Mṛigashiras and Phâlguna are thus the correlative pairs of successive year-beginnings depending entirely upon the precession of the equinoxes ; and the facts, statements, texts and legends discussed in the previous chapters supply us with reliable evidence, direct and indirect, of the existence of all these year-beginnings in the various periods of Aryan civilization. It has been further shown that not only the traditions, but also the primitive calendar of the Parsis bears out the conclusions we have deduced from the Vedic works.

We have so far considered only one of the traditional year-beginnings recorded in the Taittirîya Sanhitâ, the Phalgunî full-moon. But it may be asked how we interpret the other mentioned along with it, and almost in the same words. Analogy at once suggests that we should interpret it in the same way as we have interpreted the first. With the Phalgunî full-moon, at the winter solstice the vernal equinox was in Mṛigashiras ; so with the Chitrâ full-moon at the solstice the vernal equinox would be in Punarvasû.

EXPLANATION :—The figure is drawn on the supposition that the earth (E) is in the centre, that the sun moves in the Ecliptic, and the precession of the equinoxes is caused by the motion of the Ecliptic. With a given Nakshatra at the vernal equinox, we can here at once find what Nakshatras would be at the other cardinal points and hence also the month at the winter solstice.

Let us, therefore, see if we have evidence in the Vedic literature in support of such an in terpretation. It may be observed that we are here entering upon the remotest period of antiquity, when the year was probably first determined with some approach to accuracy ; and even in the Vedas there is hardly anything beyond vague traditions about this period, while the Greeks and the Parsis have not, it appears, preserved even these.

There is no express passage which states that Punarvasû was ever the first of the Nakshatras, nor have we in this case a synonym like *Agrahâyaṇa*, or Orion, wherein we might discover similar traditions. There are, however, some indications about the oldest position of Punarvasû preserved in the sacrificial literature. The presiding deity of Punarvasû is Aditi, and we are told in the Aitareya Brâhmaṇa i. 7, and the Taittiriya Sanhitâ vi. 1. 5. 1, that Aditi has been blessed with a boon that all sacrifices must commence and end with her. The story begins with the statement that the Sacrifice (the mysterious sacrificial personage) went away from the gods. The gods were then unable to perform any further ceremonies, and did not know where it (the sacrifice) had gone to ; and it was Aditi that helped them, in this state, to find out the proper commencement of the sacrifices.* This clearly means, if it can mean anything, that before this time sacrifices were performed at random, but it was at this time resolved and fixed to commence them from Aditi. Aditi was thus the oldest and the first commencement of the sacrifice or the year. In the Vâjasaneyi Sanhitâ 4. 19 Aditi is said to

* Ait. Br. i. 7. A similar tradition about Orion is narrated in Greek mythology. It is stated that having lost his sight he followed a guide to the east in search of the sun and there, by, exposing his face to the rising sun, his sight was restored.

be *ubhayatah shîrṣhṇî*, "double-headed," and the commentators interpret it to mean that the two termini of the sacrifices, which began and ended with Aditi, are the two heads here alluded to. These traditions are further corroborated by the sacrificial ceremonies. According to the sacrificial terminology the 4th day before Viṣhûvân or the central day of the yearly satra is called the Abhijit day. "In the sixth month," observes Dr. Haug,* "there are three Abhiplava, *ṣhalahas* (six-day's periods) and one Pṛiṣhṭhya *ṣhaḷaha*." This makes up the first 24 days of the sixth month. The following days are thus enumerated : the Abhijit day, the three *svarasâman* days and the Viṣhûvân, or the central day which stands quite apart." Thus if we exclude the Viṣhûvân day, as standing apart by itself, this gives us four days, and with the two days—*Atirâtra* and *Chaturvinsha*—which are taken up by the initial ceremonies of the *satra*, we make up the *ṣhaḷaha* wanted to complete the six months. The Abhijit day thus falls on the fourth day before the Viṣhûvân. Now if Abhijit day be supposed to be named after the Nakshatra of that name (*i. e.*, when the sun is in Abhijit) then the Viṣhûvân, or the autumnal equinox must fall four days—or as the sun travels over about 1° of the ecliptic each day, 4°—after the asterism of Abhijit; and it can be shewn by astronomical calculation that, with Aditi or Punarvasû at the vernal equinox to commence the sacrifice, we get nearly the same result. In the Sûrya Siddhânta (viii. 3 table) the longitude of Punarvasû is said to be 93°, while that of Abhijit is 266° 40′, that is, in other words, Abhijit would be about 6° behind the

* See Dr. Haug's translation of the Aitareya Brâhmana iv. 12, p. 279, note.

autumnal equinox or Vishuvan, if we suppose the vernal equinox to exactly coincide with Punarvasû. With the vernal equinox in Punarvasû there is again no other Nakshatra nearer to or at the autumnal equinox to mark the Vishûvân day. We can, therefore, now understand why Abhijit, which is so far away from the ecliptic, should have been included in the old list of the Nakshatras. It marked the approach of the Vishûvân in the primitive sacrificial calendar, but when it ceased to be used for that purpose owing to the falling back of seasons, it was naturally dropped from the list of the Nakshatras, as it was far away from the Zodiac. If Bentley's suggestion about Mûla and Jyeshṭhâ be correct, this must have been done at the time when the vernal equinox was in Orion. But be that as it may, it will, I think, be clear from the above that the position of the Abhijit day in the sacrificial literature fully supports the tradition about Aditi, the presiding deity of Punarvasû having discovered the commencement of the sacrifice. Aditi at this time must have also separated the Devayâna from the Pitṛiyâna and thus may have been appropriately called the mother of the Devas (Rig. x. 72. 5).* It was from her that the Âdityas were born (Rig. x. 72. 8; Shat. Br. iii. 1. 3. 2.), or the sun commenced his yearly course.

* Aditi is here said to be the daughter of Daksha, also cf. Rig. vii. 66. 2. In Purâṇic traditions the 27 Nakshatras are said to be the daughters of Daksha who gave them to the moon. If we combine these two traditions Aditi would be at the head of all the Nakshatras, in the same way as Mṛigashiras or the Krittikas headed the list in later times. There are again many legends in the Purâṇas, stating that everything was born from Aditi. We can account for all these facts if we place Aditi at the vernal equinox, when the calender was first fixed for the sacrificial purposes.

The only other tradition I could find in the Vedic literature about this position of Aditi is the story of the asterismal Prajâpati given in the Taittirîya Brâhmaṇa (i. 5. 2. 2).* The asterism of Chitrâ is here said to be the head of this Prajâpati, Svâti the heart, Hasta the hand, Vishâkhâ the thighs, and Anûrâdhâ the foot. Many conjectures are made about the meaning of this figure, but none of them satisfactorily explains why Prajâpati, who is said to be the god of time or the lustrum of years in the Vedânga Jyotisha, should have been represented in this way. I propose that we should interpret it after the manner of a similar representation of Brahman by Bâdarâyana, † wherein the different signs of the Zodiac are said to be similarly related to the different parts of the body of Brahman or the Creator. Prof. Max Müller has thus translated the verse :—" The ram is the head, the face of the Creator is the bull, the breast would be the man-pair, the heart the crab, the lion the stomach, the maid the hip, the balance-bearer the belly, the eighth (scorpion) the membrum, the archer his pair of thighs, the Makara his pair of knees, the pot his pair of legs, the fish his two feet."‡ Thus if Meṣha was Brahman's head when the *Rashis* were introduced Chitrâ could well be said to be the head of Prajâpati when the Chitrâ full-moon commenced the year. But though we

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* या वै नक्षत्रीयं प्रजापतिं वेद। उभयोरेनं लोकयोर्विदुः। हस्त एवास्य हस्तः। चित्रा शिरः निष्ट्या हृदयं। ऊरू बिशाखे। प्रतिष्ठानुराधाः। एष वै नक्षत्रीयः प्रजापतिः।

† मेषः शिरोऽथ वदनं वृषभो विधातुः वक्षो भवेन्नृमिथुनं हृदयं कुलीरः।
सिंहस्तथोदरमथो युवतिः कटिश्च बस्तिस्तुलाभृदथ मेहनमष्टमः स्यात्॥
धन्वीचास्योरुयुगं मकरो जानुद्वयं भवति।
जंघाद्वितयं कुंभः पादौ मत्स्यद्वयं चेति॥

‡ India; what it can teach us? pp. 322, 323.

can thus satisfactorily account for the fact why Chitrâ should have been called the head of Prajâpati, yet we cannot give an equally satisfactory reason in the case of one of the Nakshatras in this representation, unless we place three intercalary months in five years. It is, however, very difficuit to determine how the intercalary months were inserted, if at all, at this remote period, and the question must therefore, to a certain extent, remain unsolved for the present. The analogy of the pictorial representation of the twelve signs of the Zodiac in later days, is, however, a strong ground to hold that the asterismal Prajâpati may have been similarly conceived when the primitive year was first determined on the Nakshatra system. There is, so far as I know, no more evidence about this primitive calendar in the Vedic works, than what has been given above. But the traces of such period which we can discover in the sacrificial literature and especially the express mention in Taittirîya Sanhitâ that the Chitrâ full-moon once commenced the year are, in my opinion, sufficient to prove the existence of such a calender in the primitive days. We cannot otherwise account why the first and last offerings in every sacrifice should be made to Aditi and why Abhijit-day should precede the Vishûvân by four days. Compared to the evidences of the Orion period, these are slender materials for the construction of the primitive Vedic calendar, but they are decidedly superior to the materials on which Dr. Geiger has determined the primitive calendar of the Iranians.

It appears to me therefore that the oldest Vedic calendar, like the oldest hymn, was sacrificial; and that the sacrifice or the year commenced with Aditi at the vernal equinox in or near Punarvasû. The phases of the moon, the seasons

and the *ayanas* further guided the ancient Aryas in measuring time for sacrificial purposes. The asterism of Abhijit marked the approach of Viṣhûvân or the central day, while Punarvasû, which soon after came to be called Yamakau, perhaps Yama and Yamî, indicated the beginning of the year. Sometime after this and before the vernal equinox had receded to Orion, the lunar months and *tithis* or days appear to have come in use; and, in fact, the whole calendar seems to have been rearranged, the year being made to commence from the winter solstice in the Chitrâ full-moon. But this did not alter the sacrificial system, which, so far as the procedure is concerned, still continues to be what it was in the oldest days. For all civil purposes the new calendar was, however, at once adopted and the two systems have continued to exist side by side up to the present day, though in a considerably modified form, as described before in the second Chapter.

The oldest period in the Aryan civilization may therefore be called the Aditi or the pre-Orion period, and we may roughly assign 6000-4000 B. C. as its limits. It was a period when the *finished* hymns do not seem to have been known and half-prose and half-poetical Nivids or sacrificial formulæ "giving the principal names, epithets, and feats of the deity invoked" were probably in use. The Greeks and the Parsis have retained no traditions of this period, for the simple reason that they carried with them only the calendar which was in force when they left the common home, while the Indian Aryas have preserved all the traditions with a super-religious fidelity and scrupulousness. It is thus that I explain why the oldest Greek and Parsi traditions do not go beyond Orion.

We next come to the Orion piriod which, roughly speaking extended from 4000 B. C. to 2500 B. C., from the time when the vernal equinox was in the asterism of Ardra to the time when it receded to the asterism of the Kṛittikâs. This is the most important period in the history of the Aryan civilization. A good many *sûktas* in the Rigveda (*e. g.*. that of Vṛishâkapi, which contains a record of the begining of the year where the legend was first conceived) were sung at this time, and several legends were either formed anew or developed from the older ones. The Greeks and the Parsis appear to have left the common home during the latter part of this period as they have retained most of these legends, and even the attributes of the constellation of Mṛigashiras, otherwise called *Agrayâṇa*, Orion or the *Pauryâni.* We can now easily understand why no confirmatory evidence about the Kṛittikâ-period is found either in the Rigveda or in the Greek and Parsi legends and traditions. This was pre-eminently the period of the hymns.

The third of the Kṛittika-period commences with the vernal equinox in the asterism of the Kṛittikâs and extends up to the period recorded in the Vedânga Jyotisha, that is, from 2500 B. C to 1400 B. C. It was the period of the Taittirîya Sanhitâ and several of the Brâhmaṇas. The hymns of the Rigveda had already become antique and unintelligible by this time and the Brahmavâdins indulged in speculations, often too free, about the real meaning of these hymns and legends, attributing the use of the foamy weapon used by Indra to a compact between him and Namuchi. It was at this time that the Sanhitâs were probably compiled into systematic books and attempts made to ascertain the meanings of the oldest hymns and formulæ. It was also

during this period that the Indians appear to have come in contact with the Chinese, and the latter borrowed the Hindu Nakshatra system. I do not mean to say that Hindus might not have improved their system by the mutual interchange of ideas as they did when they came to know of Greek astronomy. But the system was decidedly of Hindu origin and of purely Hindu origin being handed down from the remotest or the pre-Orion period in the Vedic literature. M. Biot was unable to assign any reason why the Chinese should have taken a leap from the shoulder to the belt of Orion to choose their fourth *sieu*. But with the older Hindu traditions the question admits of an easy explanation, as the belt was therein the real Mṛigashiras or rather the top of Mṛiga's head.

The fourth and the last period of the old Sanskrit literture extends from 1400 B. C. to 500 B. C. or to the birth and rise of Buddhism. It was the period of Sutras and philosophical systems. It may be called the real pre-Buddhistic period. But as this has been sufficiently discussed by other writers I need not go into its further details.

I do not mean to lay down hard-and-fast limits of each of these periods of antiquity, nor do I intend to say anything about the period which must have elapsed before the Vedic Aryas were able to fix their primitive calender in the Aditi period. The beginning of the Aryan civilization must undoubtedly be placed a long time before the people were able to conceive and determine the calender. But I do not wish to enter here into these speculations. I take my stand only upon what we find recorded in the Vedic works, and hence all that I mean is that if the astronomical allusions, references, facts, and legends in the Vedic works can have any meaning, we cannot materially shorten the periods I have here indi-

cated. We may not rely on vague traditional beliefs amongst one nation alone, but when we find that the traditions of India, Greece, and Iran, agree in their important features, and can be explained satisfactorily only by placing the vernal equinox in Orion, and when we have an express authority for doing so in the Rigveda, I do not think that we can reasonably refuse to accept the conclusions deduced therefrom. It is true that we have determined the oldest Vedic periods from the traditions we find recorded in the Rigveda, and, strictly speaking, it is the periods of the traditions and not of the hymns into which they have been incorporated. But this does not, in my opinion, materially affect the conclusions we have arrived at above regarding the ancient period of the Vedic literature. I don't mean to deny that the hymns may not have been sung some time after these traditions and legends were originally conceived, or that after they were first sung the hymns might not have been somewhat modified *in form* in passing from mouth to mouth before they became settled in the form in which we now possses them. But though so much may be legitimately conceded, I think that it is impossible to hold that the hymns were composed thousands of years after the stories narrated in them were first conceived. For, as a matter of fact, we find that the Rigveda hymns had already become antiquated and unintelligible in the days of the Taittirîya Sanhitâ and the Brâhmaṇas. The Taittlrîya Sanhitâ places the vernal equinox in the Kṛittikâs, and I have shown that we must fix its date at about 2500 B. C. If the hymns of the Rigveda Sanhitâ were unintelligible at this time, they must have been sung several conturies before it. The comparison of the Taittirîya with the Rigveda Sanhitâ further shows that while the first mentions three year-beginnings—one current and two old—the second only mentions one.

Again, the Rigveda Sanhitâ contains no reference to the Krittikâs as the mouth of the Nakshatras. I therefore conclude that the legends in question must have been incorporated into the hymns of the Rigveda, when they were still intelligible, that is, in the Orion period. It is of course impossible to determine the dates of individual hymns. That all of them were not sung at one time is quite evident from their style. Some of the hymns distinctly speak of older hymns or bards, while in Rig. x. 99.9 the hymns are said to proceed directly from the *purûsha* or the sacrificial personage. All that we can therefore legitimately say is that the hymns, which contain older traditions and legends, *e. g*, of the Ribhus and Vrishakapi, must have been composed in the Orion period. Some of the hymns may even be still older and some latér, but generally speaking we may suppose that 4000 and 2500 B. C. are the *limits* of this period. This may require us to assume the existence of some Vedic verses at a time when the Hindus, the Greeks and the Parsis lived together. Some scholars may hesitate to accept such a conclusion. But so far as I know the conclusion is not inconsistent with the results of comparative Philology or Mythology. Prof. Max. Müller in his *Biographies of Words* (pp. 188-198) gives a list of about sixty mythological names which may be shewn to be common to Greek and Sanskrit.* If so many mythological names can be shewn to be phonetically identical it is impossible to suppose that no songs, celebrating the deeds of these deities, existed in the Indo-Germanic period. Westphal

* For instance *Ribhu* is compared to Greek *Orpheus*, *Saramâ* to Gk. *Elenes*, *Vritra* to Gk. *Orthros*, *Dâsahantar* to Gk. *Deophentes*. I have already referred to his suggestion regarding the comparison of *Vrishâkapi* with Gk. *Erikapaeos*. If all these deities existed in the Indo-Germanic period, why not their hymns ?

has already proved the existence of poetry in the Indo-Germanic period, and Dr. Kuhn has endeavoured to trace whole formulæ back to the beginning of Indo-European poetry. Verbal coincidences such as, Sk. *pada*, Av. *padha*, Gk. *pous*, all meaning a metrical foot, again point to the same conclusion.* The results of comparative Philology, are therefore, not only not inconsistent with, but, on the contrary, corroborate the conclusions we have independently deduced from the astronomical references and allusions recorded in the old Vedic literature. But I would not make my case rest on such grounds. It must be remembered that we have not been speculating in any way about the oldest Vedic periods. Our conclusions have been based on express statements and texts in the Vedic literature and unless the texts themselves are questioned or other more reasonable interpretations suggested, we shall not be justified in disregarding these results, simply because they do not support certain literary hypotheses, guesses, or conjectures, as for instance, those that have been previously referred to in the first chapter. The results of the literary method may be moderate. But moderation is a virtue only when we have to make guesses about the periods of antiquity from uncertain data. Where however we have definite texts and traditions to rely upon, nothing but prejudice can deter us from drawing legitimate conclusions from them on the ground that they take us too far back. The astronomical method, I admit, is vague, in so far as it does not enable us to determine the exact date of *all* the Vedic hymns or works, but it is certainly superior to the linguistic method inasmuch as it supplies us with certain definite and undisputed facts, for instance, the position

* See Dr. Schrader's Pre-historic Antiquities of Aryan Peoples, Part I., Chap. II., pp. 27, 28.

of the equinoxes which can safely be made the nuclei of the different periods of antiquity. When the centres of each period are thus indisputably fixed and determined, we can then use the literary or the linguistic method to supplement these results by determining the duration of each period. There would then be no real opposition between the two methods. The one would determine the specific points of time, while the other would give us the range of the different periods. In other words, the first would supply the piers and the second the arches of the bridge, which we mean to construct across the period of antiquity, and which must therefore be completed with the assistance of both.

It may, however, be urged that if the beginning of the year was twice altered owing to the precession of the equinoxes, how is it that we do not find the traces of the intermediate stages or of the changes in the seasons in the old Vedic works? How, it may be further asked, did the Indian Aryas not discover the precession of the equinoxes in the early Vedic times? But it is not at all difficult to answer these questions. We might as well ask how no one before Bhâskarâchârya or Newton ever thought of the attraction of the earth, though since the very beginning of the human race every one observed heavy objects falling down to the surface of the earth. The reason is plain enough. Celestial and natural phenomena cannot be fathomed or understood without a steady and close observation for centuries, and, above all, until all the auxiliary, or rather the whole group of sciences are proportionally developed. If we bear this circumstance in mind, we can, I am sure, discover sufficient traces of the intermediate changes in the Vedic works. Thus we find that of all the ancient

nations the Hiudus alone had well nigh accurately determined the rate of the motion of the precession of the equinoxes. Hipparchus considered it to be not less than 36″, while the actual motion at present is 50″· 25 per year. Ptolemy adopted, as observed by Prof. Whitney, the minimum of 36″ determined by Hipparchus; and it is evident that the Hindu astronomers who fixed the rate at 54″ per year could not have borrowed it from the Greeks. Prof. Whitney is at a loss to understand how the Hindus succeeded in arriving at a determination of the rate of motion, so much more accurate than was made by the great Greek astonomer, and he observes that it might be a "lucky hit on their part."* But why should they try to hit, even luckily, when they could have easily borrowed it from the Greeks? I am therefore disposed to think that it was independently, and almost correctly, discovered by the Hindus long before other nations could do so, though we cannot exactly fix the period when it was done; and that there were sufficient materials for the purpose in the old literature of India.

Let us next see what traditions about the intermediate stages have been preserved. First of all I refer to the tradition of Rudra killing Prajâpati, the god of time, for receding towards his daughter Rohiṇî. The Aitareya Brâhmaṇa (iii. 33) describes this conduct of Prajâpati as *akṛita* or unprecedented and such as deserved to be severely noticed by the gods. Can we not herein discover the fact that the sun was gradually receding towards Rohiṇî, by the precession of the equinoxes? The ancient priests, who cbserved the fact as they watched the Nak-

* See Whitney's notes to the Sûrya Siddhânta, iii. 13., p. 105.

shatras at the commencement of the year, could not account for the change, and they rightly and honestly believed that it was a great calamity that the sun or Prajâpati should thus follow an unprecedented course. I have previously referred to a verse from Garga,* which says that if the Uttarâyaṇa commenced otherwise than from the asterism of Dhanishṭhâ it foretold a great danger; and we may suppose that the Vedic Aryas similarly believed that if the sun ceased to commence the year from Orion, it was an unpecedented calamity. Prajâpati, however, was punished for his unusual conduct, and there the matter ended for the time being. I may also refer here to the ancient mode of deriving the word Rohiṇî. The Arabs called it Al-Dabaran or "the follower" evidently because it came next after the Krittikâs.† Bnt the Hindus called it Rohiṇî, "the ascended" inasmuch as they noticed that the sun gradually ran towards it in oldest days. It has been suggested that we should explain the legend of Prajâpati by reference to the daily rising of Rohiṇî, Mṛigashiras, and Rudra in succession. But this explanation hardly accounts for the fact why Prajâpati was considered as literally running after Rohiṇî in an *unprecedented* way. Surely we cannot suppose that the Vedic priests were ignorant of the fixed position of these constellations, and if so, we cannot account for the fact why they considered Prnjâpati as running after and thinking of living together with Rohiṇî unless they had noticed the actual recession of the sun towards Rohiṇî owing to the equinoxes. The tradition of Prajâpati and Rudra is thus comparatively speaking a later tradition though it seems to have been completely formed before the separation of the Greeks and the Parsis from the Indian Aryas.

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* See *supra*, Chapter II, p. 19.

† See Whitney's notes to Sûrya Sid., viii. 9., p. 185.

But the question, which was dropped at this time after punishing Prajâpati, was again taken up when the equinox had receded to the Kṛittikâs. The seasons had fallen back by one full month and the priests altered the year-beginning from the Phalgunî to the Maghâ full-moon, while the list of the Nakshatras was made to commence from the Kṛittikâs, instead of from Agrahâyaṇa. There is nothing surprising in the fact that the change should have been quietly introduced when we see that Varâhamihira did the same in the fifth century after Christ when the Ashvinî system was introduced.* The calendar was mainly used for the sacrificial purposes, and when the priests actually observed that the sun was in the Kṛittikâs, and not in Mṛigashiras, when day and night were equal, they altered the commencement of the year to the Kṛittikâs, especially as it was more convenient to do so at this time when the cycle of seasons had receded by one full month. The priests knew that the year commenced a month earlier in older days, but like Varâhamihira they must have appealed more to the actual facts, as they saw them, and introduced the change without attempting to discover its real cause.

The Vedânga Jyotiṣha introduces the third change, when the seasons had further fallen back, not by a month, but by a fortnight. It was probably during this interval that the beginning of the month was altered from the full-moon to the new-moon, and when this beginning of the month was so altered, advantage was taken of the receding of the seasons by a fortnight, to commence the year with the new-moon in Dhaniṣhṭhâ as the Vedânga Jyotiṣha has done.

From this the next recorded step is to Ashvinî. There is, however, an interesting story related in the Mahâbhârata

* See *supra* Chap. III. p. 36.

which evidently refers to an abortive attempt to reform the calender when the seasons had again fallen back by a fortnight. In the 71st chapter of Âdiparva we are told that Visvâmitra attempted to create a new world,* and make the Nakshatras commence with Shravaṇa, instead of Dhaniṣhṭha; and the same story is alluded to in the Ashvamedha Parva, chapter 44. The tradition can also be found in other Purâṇâs where Visvâmitra is represented as endeavouring to create a new celestial sphere. It appears, however, that he did not succeed, and the Krittika-system, as modified by the Vedânga Jyotiṣha, continued to regulate the calendar until the list of the Nakshatras was quietly made to begin, as noticed in the third chapter, with Ashvinî in later times.

We have thus an almost continuous record of the year-beginnings from the oldest time down to the present in the literature of India, and in the face of this evidence it is useless to indulge in uncertain speculations about the antiquity of the Vedas. I have already referred to the occurrence of the *pitṛi-pakṣha* in Bhâdrapada as a relic of the time when the year commenced with the Phalgunî-full-moon. Our Shrâvaṇi ceremony appears to have been once performed in Bhâdrapada (Manu iv. 95) ; and as it marked the beginning of the rains, when the herbs appear anew (Âshvâlâyana

* Mahâ. Adi. 71, 34.

चकारान्यं च लोकं वै क्रुद्धो नक्षत्रसंपदा।
प्रतिश्रवणपूर्वाणि नक्षत्राणि चकार सः॥

and again in the Ashv. 44. 2.

अहः पूर्वं ततो रात्रिः मासाः शुक्लादयः स्मृताः।
श्रवणदीनि ऋक्षाणि ऋतवः शिशिरादयः॥

Gṛihya Sûtra iii. 5, 2), we can here trace the recession of the rainy season from Bhâdrapada to Shrâvaṇa and from Shrâvaṇa to Âshâḍha (Sânkhyâyana Brâhmaṇa i. 3) and finally from Âshâḍha to Jyeshṭha, as at present, thus fully corroborating the recession of the beginning of the year or the winter solstice from Chaitra to Phâlguna, from Phâlguna to Mâgha, and from Mâgha to Pausha. The evidence of the recession of the seasons is not, however, as complete as that of different year-beginnings, inasmuch as there are various local causes besides the precession of the equinoxes that affect the ocurrence of the seasons. The seasons in the Central India and Central Asia cannot, for instance, be the same, and if the Aryas came into India from the North-West, the very change of locality must have caused a corresponding change in the seasons. The evidence of the change of seasons cannot therefore be supposed to be so reliable and conclusive as that of the successive changes in the beginning of the year above mentioned.

Lastly, there remains only one question to be considered. Is the Vedic period here determined consistent with the traditions and opinions entertained about it by the ancient and modern scholars? I think it is. I have already referred to the remarks of Prof. Weber who, though he regards the Kṛittikâ evidence as vague and uncertain, yet on geographical and historical grounds arrives at the conclusion that the beginnings of the Indian literature may be traced back to the time when the Indian and the Iranian Aryas lived together; and this opinion is confirmed by the fact that there are Yashts in the Zend Avesta which may be considered as "reproductions" of the Vedic hymns. Dr. Haug considers that this condition may be satisfied if we place the beginning

of the Vedic literature in 2400 B. C ;* but he was not cognisant of the fact that the vernal equinox can be shown to have been in Mṛigashiras at the time when the Parsis and the Indians lived together. In the light of this new evidence, there is therefore no reasonable objection for carrying the periods of the Vedic literature further back by over a thousands years or to about 4000 B. C. This period is further consistent with the fact that in 470 B. C. Xanthos of Lydia considered Zoroaster to have lived about 600 years before the Trojan War (about 1800 B. C.) ; † for according to our calculation the Parsis must have separated from the Indian Aryas in the latter part of the Orion period, that is to say, between 3000 to 2500 B. C ; while, if we suppose that the separation occurred at a considerably later date, a Greek writer in the fifth century before Christ would certainly have spoken of it as a recent event. Aristotle and Eudoxus have gone still further and placed the era of Zoroaster as much as 6000 to 5000 years before Plato. The number of years here given is evidently traditional, but we can at any rate infer from it this much that at the time of Aristotle (about 320 B. C) Zoroaster was considered to have lived at a very remote period of antiquity ; and if the era of Zoroaster is to be considered so old, *a fortiori*, the period of the Vedas must be older still. Then we have further to consider the fact that an epic poem was written in Greek in about 900 or 1000 B. C. The language of this epic is so unlike that of the Vedic hymns that we must suppose it to have been composed long time after the Greeks left their ancient home and travelled westward. It is not, therefore, at all improbable that they separated after the formation of the legends

* Dr. Haug's Intr. to Ait. Br., p. 48.
† See Dr. Haug's Essays on Parsis, p. 298.

of Orion and before the vernal equinox was in the Kṛittikâs, that is, between 3500 to 3000 B. C. Finally we can easily understand how the acutest and most learned of Indian theologians and scholars believed the Vedas to have come down to them from an unknown period of antiquity. A revelation need not necessarily be *anâdi*, or without a beginning. The history of the Bible and the Koran shows us that a revelation can be conceived to be made at a particular period of time. If so, the mere fact that it is believed to be revealed does not account for the opinion entertained by the Hindu theological writers that the Veda has come down to them from times beyond the memory of man. Some of these writers lived several centuries before Christ, and it is quite natural to suppose that their opinions were formed from traditions current in their times. The periods of the Vedic antiquity we have determined render such an explanation highly probable. According to the Christian theology, the world was created only about 4000 years before Christ; or, in other words, the notions of antiquity entertained by these Christian writers could not probably go beyond 4000 B. C., and not being able to say anything about the period preceding it, they placed the beginning of the world at about 4000 B. C. The Indian theologians may be supposed to have acted somewhat in the same manner. I have shewn that the most active of the Vedic period commenced at about 4000 B. C., and there are grounds for carrying it back still further. The *form* of the hymns might have been more or less modified in later times; but the *matter* remained the same, and coming down from such a remote antiquity it could have been easily believed by Jaimini, Pânini, and the Brahmâvadin of old to have been in existence

almost from the beginning of the world, or rather the beginning of all known things. We can thus satisfactorily account for all the opinions and traditions current about the age of the Vedas amongst ancient and modern scholars in India and in Europe, if we place the Vedic period at about 4000 B. C, in strict accordance with the astronomical references and facts recorded in the ancient literature of India. When everything can thus be consistently explained, I leave it to scholars to decide whether the above period should or should not be accepted as determining, as correctly as it is possible to do under the circumstances, the oldest period of Aryan civilization. It is the unerring clock of the heavens that has helped us in determining it, and it is, in my opinion, hardly probable to discover better means for the purposes. The evidence was in danger of being obliterated out of the surface of the heavens, when the Greeks borrowed their astronomical terminology from the Egyptians. But it has fortunately escaped and outlived, not only this, but also another threatened attack when it was proposed in England and Germany to name the constellation of Orion after Nelson or Napoleon as a mark of respect for these heroes. The bold and brilliant Orion, with his attendant Canis, preserves for us the memory of far more important and sacred times in the history of the Aryan race.

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APPENDIX.

Âgrayaṇa and Orion.

I have already stated in brief my reasons for provisionally identifying Sk. *Âgrayaṇa* with Gk. *Orion*, and here I wish to examine the point more fully, not because my case rests upon it, bnt simply with a view to indicate the real nature of the objections that may be urged against the proposed identification. If philologists are still inclined to hold that the identification is not even probable, we shall have to look for some other Aryan derivation, as the similarity of the Eastern and Western traditions of Orion is, in my opinion, too strong to be accidental.

Âgrayaṇa is evidently derived from *agra* and *ayana*. Of these *ayana*, which is derived from *i*, to go, may be represented by *iōn* in Greek : cf. Sk. *âyus*, Gk. *aiōn* Sk. comparative termination (nom. sin.) *îyân* Gk. *iōn*; Sk. termination *âyana*, as in *Gargyâyaṇa*, Gk *iōn*, as in *Kroniōn*, 'the descendant of Kronos'. The initial *â* in Sk. *Âgrayaṇa* may also become *ō* in Greek; as in Sk. *âshayana*, Gk. *ōkeanos;* Sk. *àshu* Gk. *ōkus*. Sanskrit *Âgrayaṇa* may therefore be represented by *Ogriōn* in Greek, and we have now to see if *g* may be dropped before *r* and *Ogriōn* can be changed into *Orion.* It is a general phonetic rule in Teutonic languages that a gutteral may disappear before a liquid, whether *initially* or *medially* ; cf. Ger. *nagel*, Eng. *nail* ; *hagel* and *hail* ; *regen* and *rain*; Sk, *kravis*, O. H. G. *rō*. Prof. Max Müller has extended the application of this rule to Latin and Greek, and Latin and French in his Lectures on the Science of Language, Vol. II., p. 309. He compares Latin *paganus* with French *paien*, Gk. *lâchne'* With Lat. *lâna*; and points

out that on the same principle *lumen* stands for *lucmen*, *examen* for *exagmen*, *flamma* for *flagma*. K. Brugmann (Com. Gr. I., § 523.) would derive O, Ir. *ār*, Cymr. *aer* from **agro* on the same principle. This shews that Sk. *agra* may be easily represented by *ār* in Teutonic languages. We may account for the change in two ways. We may either suppose that the final gutteral of a root is sometimes dropped before terminations beginning with a liquid and thus put *luc-men* = *lu-men*, *fulg-men* = *ful-men*, *flag-men* = *fla-men*, *ag-men* = *ā-men*, *ag-ra* = *ā-ra* (with compensation vowel lengthening; Bopp derives Sk. *roman*, a hair from *ruh-man* growing, on the same principle); or we may suppose that the change is in accordance with general phonetic rule which sanctions the omission of a gutteral before a liquid in such cases. But whichsoever explanation we adopt, there no question as to the change itself. It must not, however, be supposed the rule is an uninflexible one, and that a gutteral *must* always be dropped before a liquid; for we find that gutteral in such cases is often either retained or labialised. cf. Sk. *grâvan*, O. Ir. *broo*, *bro*, (gen. *broon*), Cymr. *breuan*; Sk. *gṛiṇâmi*, O. Ir. *gair*. The proper rule to deduce from these instances would therefore be, that *gr* in Sanskrit may be represented by *gr*, *br* or *r* in Teutonic languages, and that all the three changes are possible.

Can we not extend the rule to Greek and Sanskrit?—is the next question we have to consider. I do not mean to deny that there are phonetic rules which are not universally applicable to *all* languages. But the present rule can be easily shewn not to belong to this class. Prof. Max Müller has already extended it to Greek and Latin and

Vararuchi, in his Prâkṛita Prakâsha II. 2, lays down that *g* in *ga* may be *medially* dropped as between Sanskrit and Prakrit, *e.g.*, Sk. *sâgara*, Pk. *sâ-ara ;* Sk. *nagara*, Pk. *na-ar*, eventually corrupted into *nara*, as in *Jun-nara* and other names of cities. This is, in fact, the same rule which, when applied to Teutonic languages, accounts for the change of *segel* into *sail*, *nagel* into *nail* and so on. Comparison of Avestic *tigra* with Mod. Per. *tir* shews that a similar change may also take place between those languages. We may, therefore, fairly say that the rule about the omission of a gutteral before a liquid obtains not only in Teutonic languages, but also between Greek and Latin, Latin and French, Sanskrit and Old Irish, Sanskrit and Prakrit, and Avestic and Modern Persian. In the face of these facts it would, I think, be unduly restricting the applicability of the phonetic rule if we refuse to apply it to Sanskrit and Greek. There is at any rate no *a priori* improbability in expecting that a similar change may take place as between Greek and Sanskrit. Let us now see if there are any instances as between Greek and Sanskrit to support such a conclusion.

Prof. Benfey compares Sk. *grâvan* with Gk. *laos* (Lat. *lapis*); and Sk. *ghrâṇa* with Gk. *ris*, *rinos*. If this comparison is correct, here at least we have two instances where a gutteral before *r* in Sanskrit is lost in Greek. It is sometimes labialised, as in Sk. *krînami*, Gk. *priami* ; Sk. *guru*, Gk. *barus ;* and sometimes retained as it is, as in Sk. *kratu*, Gk. *kratus ;* Sk. *gras*, Gk. *grao*, to swallow. From these instances we may therefore infer that as between Greek and Sanskrit, the *initial* gutteral in *kr* or *gr* in Sanskrit may be either retained as it is, or labialised or dropped in Greek,—the same rule which holds good, as shewn above,

in Teutonic languages. It may be noticed here that while *grâvan* becomes *laos* in Greek, it is *broon* in Old Irish, that is, while the initial *g* of a Sanskrit word is labialised in Old Irish it is dropped in Greek. This shews that the initial *kr* or *gr* in Sanskrit may be differently represented in different languages. Sanskrit *kṛimis*, Lat. *vermis*, Gk. *elmis*, and Sk. *klipta*, Avestic *kerepta*, Gk. *raptos*, may, I think, also be regarded as further illustrations of the same rule. I know that the connection between the words last quoted is still considered doubtful, but that is because the rule about the omission of a gutteral before a liquid, as between Greek and Sanskrit, is not yet recognised by scholars. If the examples I have given at the beginning of this paragraph are, however, sufficient to justify us in applying the rule to Greek and Sanskrit, the instances last cited may be taken as further supporting the same view.

With these instances before us, it would be unreasonable to deny that the three possible changes of *kr* and *gr*, which obtain in Teutonic languages, do not take place as between Greek and Sanskrit, at least *initially*; and if these changes take place initially, analogy at once suggests that they would also take place *medially*. At any rate there is no reason why they should not. It may be urged that a comparison of Sk. *chakra* with Gk. *kuklos* shews that a medial *kr* is retained as it is. But as pointed out above the argument is not conclusive. There may be cases where *kr* is retained as it is. But we have seen that by the side of such cases, instances can be quoted where it is changed to *pr* or *r* initially; and we may expect the same threefold possible change *medially*. It is admitted that labialisation takes place *medially*; and we have therefore to see if there are any instances where a gutteral is dropped before a liquid in the body of a word. K. Brugmann tells us that

at one period *gn* and *gm* came to be represented by *n* and *m* in Greek; cf. *gignomai* and *ginomai, stugnos* and *stunos.* Now this change *in the body of a word* is exactly similar to that of *agmen* into *amen*, and is evidently due to the same rule, which accounts for the latter change. Similarly Gk. *anoos* may be compared with Sk. *ajna*, and Gk. *arinos* to Sk. *aghrâṇa.* But I do not lay much stress on these inasmuch as these words may be supposed to have been derived by the addition of the prefix alpha to the already existing Greek forms, and not directly obtained from Sanskrit *ajna* and *aghrâṇa*. The change of *gignomai* into *ginomai* or of *gignosko* into *ginosko* cannot, however, be so accounted for, and if *g* before *n* is dropped in the body of a word, there is no reason why it should not be dropped before *r* on the analogy of the phonetic rule given above. Works on philology do not give any more instances of such changes, but as observed above, the attention of scholars does not appear to have been directed to this point. Otherwise I do not think it was difficult to discover the similarity between Gk. *turos* and Sk. *takra*. *Takra* is derived from *tanch* (**teng*) to contract, to coagulate or curdle, and according to Fick the root is Indo Germanic. It is an old Vedic root, and we have such expressions as *dadhnâ âtanakti* 'coagulates (milk) with curds' in the Taittiriya Sanhitâ II. 5. 3. 5. *Takra* therefore literally means 'curdled milk' and not 'curds mixed with water' as the word is understood in modern Sanskrit. Now, if we suppose that the rule, which sanctions the omission of *g* or *k* before *r* or *m* in other languages, also holds good as between Greek and Sanskrit, not only initially (as in *grâvan* and *laos*) but also *medially*, as in *gignomai* and *ginomai*, Sk *takra* may be easily identified with Gk. *turos* meaning 'cheese'. *Takra* may thus be said to have retained its root meaning in Greek.

Turos is an old Greek word used in the Odyssey, and it has not yet been explained by anything in Indo-Germanic. Dr. Schrader therefore records a suggestion that it should be derived from Turko Tataric *turak*. But if Sanskrit *sâra* and *sarpis* are found in Greek *oros* (whey) and *elphos* (butter,) it is not reasonable to suppose that *turos* alone was borrowed from a non-Aryan source. *Takra* in modern Sanskrit means 'curds mixed with water and churned' and perhaps it may be contended that we cannot identify it with *turos*, which means 'cheese.' I have, however, shewn that *takra* etymologically means 'curdled milk' and not 'curds dissolved in water' which is evidently its secondary meaning. Besides when we see that *sâra* which in Sanskrit denotes 'curdled milk,' has become *oros*=whey in Greek, and *serum* in Latin, there is nothing unusual if we find *takra* and *turos* used in slightly different senses in the two languages. I have already suggested in the body of the essay that we may identify Sk. *Shukra* with Gk. *Kupris*. *Chakra*=*kuklos*, *Shukra*=*Kupris*, and *takra*=*turos*, may thus be taken to illustrate the application of the rule above discussed, regarding the three-fold change of *kr* or *gr*, to Greek and Sanskrit *medially*; and instances have been already quoted to show that the rule holds good *initially* as between Greek and Sanskrit. We may therefore conclude that the change of *gignomai* into *ginomai* is not a solitary instance, and that as a general rule *g* may be dropped, labialised or retained before a liquid as between Greek and Sanskrit whether at the beginning or in the body of a word. We might even discover further instances of the applicability of this rule; for, if *takra* is thus correctly identified with *turos*, we may, on the same principle, identify Sk. *agra* with Gk. *oros*, meaning top, summit. It was impossible to represent Sanskrit *agra* by a separate Greek word otherwise. It could not be repre-

sented by *agros* in Greek as the latter word corresponded to Sk. *ajra*, a field; nor can *agra* be changed to *akris* which represented Sk. *ashri*. Sanskrit *agra*, therefore, naturally came to be represented by *oros*. *Oros*, meaning top or summit, has not yet been satisfactorily derived in any other way.

It will be seen from the above that we have sufficient grounds to hold that the rule about the omission of a gutteral before a liquid, whether *initially* or *medially*, applies to Greek and Sanskrit in the same way as it does to other languages; and if so, Sk. *Āgrayaṇa* can be represented by *Orion* in Greek.

I have already quoted Brugmann to show that **agra* becomes *ār* or *aer* in Teutonic languages. Now further comparing Lat. *integru*, *integer* with Fr. *entier*; Gk. *dakru*, Goth. *tagr* with Eng. *tear*; *pagan* with *paien* and *regen* with *rain*, we are led to infer that where *k* or *g* is dropped before *r* or a liquid we may expect *two* contiguous vowels, probably because this *gr* is at first optionally altered into *ger* or *gar*. We can now understand why *Orion* was sometimes spelt as *Oarion*; and the existence of this double form confirms, in my opinion, the derivation above suggested. As for *Orion* alone we might derive it from *oros*, limit, or *ōra*, spring, and *ion*, going thus, giving the same meaning, *viz.*, the limit or the beginning of the year or spring, as *Āgrayaṇa* in Sanskrit. But this does not account for the double form—*Orion* and *Oarion*—unless the latter be taken for a poetic or a dialectic variation of *Orion*. I therefore prefer to derive the word from Sanskrit *Āgrayaṇa*.